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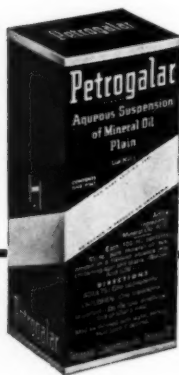
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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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No. 9

RECENT TRENDS IN CANCER RESEARCH

H. B. ANDERVONT

Principal Biologist, National Cancer Institute,
National Institute of Health
Bethesda, Maryland

THE word "trend" signifies the development in a general direction which has taken place in cancer research during the past few years. Four trends will be discussed at this time.

1. Inbred animals and their use in cancer studies.
2. The study of naturally occurring products in the body which are of importance in the occurrence of mammary cancer in mice.
3. Chemical substances which produce cancer in experimental animals.
4. Recent work on virus-induced tumors.

Inbred Animals and Their Use in Cancer Studies

The term inbred is applied only to those strains of mice which have been bred brother-to-sister for at least twenty generations. This prolonged inbreeding produces a strain of mice in which all animals may be regarded as identical twins, and the establishment and use of such strains have done much to reduce the number of variables encountered in the study of experimental cancer. This study includes three groups of malignancies: spontaneous tumors which arise in normal untreated animals, induced tumors which are caused by the administration of certain chemicals, and transplantable tumors which are propagated by implanting a piece of tumor into the tissues of another host. During recent years a series of investigations² have been carried out with inbred strains of mice to determine the outstanding and comparative characteristics of the various strains relevant to tumor development,

so that it can be known which strain supplies the most desirable test animals for any given phase of cancer work.

The strains differ in the order of their susceptibility to subcutaneous tumors induced by chemical carcinogens. The susceptibility of a strain is determined by the period of time elapsing between the administration of a known amount of the carcinogen and the appearance of a tumor at the site of injection. In the more susceptible strains 0.8 mg. of 1,2,5,6,-dibenzanthracene dissolved in lard induces tumors in the average time of 18 weeks while in the more resistant strains the same dosage requires an average time of 36 weeks. These inbred strains offer the worker who desires to study variations in susceptibility to induced tumors an opportunity to do so without the use of animals of different species which may introduce complicating factors.

The strains also exhibit wide variations in their susceptibility to the development of spontaneous mammary gland tumors. The breeding females of certain strains have an incidence of almost 100 per cent while the breeding females of other strains have an incidence of less than 1 per cent. Strains in which the breeding females develop breast cancer reveal a striking difference in the incidence of tumors in the non-breeding females. For example, the mammary cancer incidence is almost 100 per cent in non-breeding strain C3H females while in strain A it is 5 per cent and in strain dba it is 50 per cent. This wide range in susceptibility to spontaneous mammary cancer presents excellent material to investigators who wish to work on the induction, prophylaxis or therapy of this type of neoplasm.

² Résumé of the George Chase Christian Lecture, delivered April 15, 1942, at the University of Minnesota.

The incidence of spontaneous pulmonary tumors has been determined in some of the mice strains. This type of tumor is not common in most species of animals but it occurs with exceptional frequency in mice. Strain A mice are by far the most susceptible to spontaneous tumors of the lung for at the age of eighteen months 85 per cent of the animals have developed this neoplasm.

Studies in the susceptibility of the strains to pulmonary tumors induced by chemical compounds have produced some very interesting results. Pulmonary tumors were induced when the compounds were fed, inhaled, applied percutaneously, or injected subcutaneously, intraperitoneally, or intravenously. This reveals that a carcinogen may produce a tumor in an organ remote from the site of its administration.

One striking feature of the pulmonary tumor studies is the correlation between susceptibility to the development of spontaneous pulmonary tumors and susceptibility to the induced pulmonary growths. Those strains which develop the most spontaneous tumors are most susceptible to the induced tumors. It is known that in mice susceptibility to both spontaneous and induced pulmonary tumors is inherited according to genetic principles, and the question arises whether the carcinogens evoke pulmonary tumors by releasing an inherited tendency or by acting directly upon the tissues of the lung.

The natural resistance of eight inbred strains to two transplantable sarcomas has been determined. The tumors used in this work were sarcoma 37 and sarcoma 180, both of which are well-known propagable growths and have been used extensively for experimental purposes in laboratories throughout the world. Natural resistance of the mice was determined by implanting a small amount of tumor just beneath the skin in such a manner that the ensuing tumor was not firmly attached to the underlying subcutaneous tissues. These tumors have been designated as cutaneous growths and have been found to be a more delicate test for natural resistance than the implantation of tumor within the subcutaneous tissues.

Sarcoma 37 grew in all strains for seven to ten days and then regressed in all mice of five strains but grew progressively and killed all mice of three strains. Sarcoma 180 grew progressively and killed all mice of seven strains but regressed

in mice of one strain. This indicates that the strains vary remarkably in their degree of resistance to the growth energies of the two tumors. The variation in susceptibility to the growth of transplantable tumors as exhibited by the different strains, together with the temporary growth followed by complete regression in certain strains, offers an opportunity for the chemist and pathologist interested in the problem of growth and regression of transplantable tumors.

When appropriate hybrid mice were tested for natural resistance to sarcoma 37 it was shown³ that susceptibility to the growth of this tumor is inherited as a dominant characteristic. Up to the present time the more careful genetic studies show that susceptibility to the development of spontaneous, induced, or transplantable tumors is inherited in a dominant manner.

The use of inbred strains of mice has revealed that there is no correlation between the susceptibility to the induction of subcutaneous tumors and the natural resistance to the growth of transplantable tumors or to the development of spontaneous mammary or pulmonary tumors, and the conclusion is drawn that none of the strains is resistant or susceptible to all types of malignancies. It is inaccurate to speak of mouse strains as of high or low resistance without specifying the type of tumor.

This brief review of the inbred strains of mice indicates that the genetic constitution of the test animal is of fundamental importance in experimental cancer and that the investigation of spontaneous, induced, or transplantable tumors can be simplified by the use of an appropriate strain or strains. Furthermore, the confusing results which may accompany the use of ordinary "market or stock" animals can be avoided. Workers in the field of experimental cancer are indebted to the geneticists who have made possible and have developed such valuable material for investigative work.

The Study of Naturally Occurring Products in the Body Which Are of Importance in the Occurrence of Mammary Cancer in Mice

This trend in cancer research is an outgrowth of the trend we have just discussed, for, without the development of high- and low-mammary-cancer strains, the transmission through the mother of the influence responsible for the occurrence

of mammary cancer in mice could not have been demonstrated. The breeding of high cancer strain females to low cancer strain males produced offspring which developed mammary cancer, while the breeding of low-cancer-strain females to high-cancer-strain males resulted in offspring which did not develop this type of neoplasm. Next it was found that foster nursing of mice of strains with a high incidence of mammary cancers by females of strains with a low incidence reduced the incidence in the fostered females, and, conversely, foster nursing of mice of strains with a low incidence by females of strains with a high incidence increased the incidence in the fostered females.

Intensive studies have revealed that at least three factors are involved in the occurrence of mammary cancer in mice. These are: the milk influence, the genetic, and the hormonal.

Little need be said concerning the milk agent for this was ably discussed by Dr. J. J. Bittner⁹ in the 1940 lecture of this series. Only a few of the more recent observations will be mentioned. It is now known that the agent is widely distributed throughout the body for it has been found in the spleen, lactating gland, and whole blood.²⁵ It is also present in mammary tumors. It is filterable and able to survive a certain amount of glycerolation.¹⁰ It produces definite morphologic changes in the architecture of the mammary gland²³ and these changes may represent precancerous lesions which eventuate into malignancy. This is of considerable interest for it suggests that the agent may be the inciter of a premalignant lesion only and leads to speculation concerning the possibility of other agents producing precancerous lesions in other organs and species and then, unlike the mammary cancer inciter of mice, disappearing or remaining undetectable in the resultant tumor.

Recent work^{11,24} shows that in the ultracentrifuge the agent can be sedimented from mouse milk and that the size of the active particle is probably less than that of some of the larger known viruses such as vaccinia virus. Further results on the identification of the agent are awaited with interest.

There is clear-cut evidence that the incidence of mammary cancers in mice is directly proportional to the time the newborn spend with their mother, that is, the amount of milk they ingest during the first hours of life. Mammary tumors

will occur in mice which have remained with their high-cancer-strain mother for only three hours after birth and the feeding of as little as 0.1 c.c. of high-cancer-strain milk will cause tumors in susceptible mice. This implies that an event occurs in the first few hours of life which leads to the development of malignancy in normal untreated mice when they are from seven to eighteen months of age. The importance of this fact must be realized when the epidemiologist attempts to correlate the occurrence of mammary gland tumors with the ingestion of mother's milk in other species of animals.

The genetic factors in the occurrence of mammary cancer in mice control the degree of susceptibility to both the milk influence and the hormonal influence. The earlier investigators showed the importance of the genetic influence when they developed strains of mice which were of high or low susceptibility to mammary cancer and it was generally conceded that the genetic constitution of the mouse was one of the essential factors involved in the occurrence of this neoplasm.

Following the discovery of the extrachromosomal influence present in mother's milk, experiments were performed to ascertain the relationship between this influence and the genetic make-up of the animal. This was accomplished⁴ by breeding high-tumor-strain females to low-tumor-strain males which produced the F_1 hybrid generation and it was found that these hybrids showed a high incidence of mammary tumors. When, however, these hybrid females were mated to resistant males the resultant first-backcross-generation exhibited a low incidence of tumors, and further breeding of the first-backcross-generation females to resistant-strain males produced mice which were almost free from mammary tumors. The use of females from high tumor lines and in all the hybrid generations permitted the passage of the milk influence to subsequent generations, but the genetic influence introduced by the males of low cancer strains rendered the animals resistant to mammary cancer. This type of experiment showed clearly that the genetic constitution of the mouse is of considerable importance in determining whether it will develop a tumor of the breast.

The exact rôle played by the genetic influence is obscure. It may enable the animal to live its allotted span of life without developing tumor

or may enable it to destroy the influence obtained in the milk. A strain of mice may be highly susceptible to mammary cancer because their genetic make-up enables them to propagate the milk influence while a low tumor strain may possess genetic factors which make them incapable of propagating the influence. The disappearance of tumors in hybrids in which the chromatin of resistant strains predominate tends to support this speculation. Furthermore, it was found⁵ that strain C mice which develop few spontaneous mammary tumors are highly susceptible to the milk influence of a high tumor strain and are able to transmit the influence through subsequent generations. Strain C mice may be regarded as possessing the genetic factors necessary for the establishment of a high-mammary-cancer strain but remain a low cancer strain until the introduction of the milk influence. Strain C57 Black mice differ from strain C mice in that they are much more resistant to the milk influence and do not transmit the influence through successive generations. Their genetic factors may enable them to destroy the influence.

These studies on the importance of heredity in the mouse should be kept in mind in any discussion concerning the effect of heredity upon the occurrence of tumors in other species. In mice we have highly inbred strains of animals which are genetically susceptible to mammary cancer as well as an agent which is a powerful cancer inciter, but two generations of breeding are sufficient to overcome both the hereditary tendency and the inciter. This indicates that in other species which do not begin to approach the mouse so far as genetic uniformity is concerned, it is extremely hazardous to predict the occurrence of tumors on the basis of tumorous or nontumorous ancestry.

The hormonal influence was long considered an essential factor in the occurrence of mammary cancer in mice.¹⁴ Male mice of high-mammary-cancer strains do not develop tumors of the breast and, as stated previously, in some strains there is a pronounced difference in the incidence of tumors in breeding and nonbreeding females. This alone is sufficient evidence of the importance of estrogenic hormones in this species. It is also known¹⁵ that cancer of the breast does not occur in females which are ovariectomized when four weeks of age and that males of certain strains will develop mammary tumors following

the administration of estrogenic hormones. The ease with which tumors can be induced in the males by estrogen depends upon their origin; for those from strains in which the females develop many mammary tumors are far more susceptible than those whose female litter mates are resistant to this neoplasm.

The discovery of the milk influence led to investigation of its relationship to the hormonal influence. It was found²¹ that foster nursing of strains with a high incidence of mammary tumors by females from strains with a low incidence reduced the incidence of mammary tumors in estrogen-treated males and that foster nursing of strains with a low incidence by females with a high influence increased the incidence in estrogen-treated males. These findings, together with the pronounced effect of foster nursing upon the occurrence of mammary tumors in females, show clearly that estrogenic hormones are not the chief stimulus in the etiology of mammary cancer in mice. Their function appears to be the preparation of the mammary gland for the activity of the milk influence; for if the milk influence is not present, large amounts of estrogen do not lead to the development of mammary tumors.

The estrogenic substances are, however, naturally occurring products in the body which play an important part in the occurrence of other types of tumors. The administration of estrogen has produced tumors of the pituitary,¹⁵ uterus,¹ testicle²² in the mouse, of the mammary gland¹⁶ in the rat, and of the uterus¹⁸ in the guinea pig.

Chemical Substances Which Produce Cancer in Experimental Animals

This trend has its roots in the observations of Percival Pott who, in 1775, recognized the relationship of soot to the cancer of chimney sweeps. This clinical observation led to a long series of attempts to produce cancer in experimental animals, but it was not until 1915 that Yamagiwa and Ichikawa induced malignant neoplasms by repeated applications of coal tar to the ears of rabbits. The use of coal tar as a carcinogen resulted in a deluge of scientific papers which contributed much to our present knowledge of cancer in experimental animals.

The more recent aspects of this trend is founded in the discovery of a definite chemical related to coal tar and possessing cancer-inducing power. Credit for this brilliant work goes to Professor

Kennaway¹² and his colleagues in London who in 1930 reported that 1,2,5,6-dibenzanthracene possesses carcinogenic properties. Since that time over 200 compounds¹⁷ have been discovered which produce cancer in experimental animals. Only a general picture of this important trend can be given at this time. A few of the more important observations will be mentioned.

1. The structural formulae of the carcinogens differ and, as yet, there is no possibility of arriving at any generalization regarding molecular structure and ability to produce tumors.
2. Isomers of powerful carcinogenic compounds are not able to produce tumors in experimental animals. These isomers are compounds which have the same empirical formula as do the carcinogens but the atoms are arranged differently in the molecule.
3. In general, those compounds which are carcinogenic produce irritation at the site of injection while those which fail to produce tumors are not irritating, but this is not true in all cases. Indeed, irritating substances such as mustard gas are known to inhibit tumor formation. The fact that some irritating compounds fail to produce tumors while other nonirritating substances do so, raises the question of whether irritation, per se, is responsible for malignancy. The irritation may have to be a special kind of irritation before it is capable of producing tumor formation.
4. One compound, 20-methylcholanthrene, is of special interest since it has been obtained from deoxycholic acid and cholic acid which are constituents of the bile. This suggests that the products of the body may be responsible for some malignancies.
5. As stated previously many compounds are able to induce tumors in organs remote from the site of application.
6. A single carcinogen may produce tumors in a number of different tissues. This is of considerable interest for it implies that a single causative agent may be responsible for a variety of tumors in a given species of animals.
7. Some compounds are regarded as possessing a certain degree of specificity. A few appear to be most active in the induction of tumors of the liver while others do not affect that organ.

The discovery of over 200 compounds capable of eliciting tumors in experimental animals shows clearly that it is unjustifiable to speak of the cause of cancer when referring to the etiology of this disease. There are probably a variety of causes of cancer just as there are a variety of cancers; and each type of cancer should be studied as a disease entity. Furthermore, tumors arising in the same organs of different species may be treat-

ed as separate diseases. There is a marked difference in the histologic appearance of mammary tumors in the rat and mouse and pulmonary tumors in the human and the mouse.

The availability of a large number of chemical carcinogens has given the investigator an opportunity to study their comparative carcinogenicity for different organs. In one such study⁶ thirteen compounds were examined for their ability to elicit tumors of the skin, subcutaneous tissues, and pulmonary tissues when injected beneath the skin, painted on the skin, or injected intravenously. Some compounds were more potent beneath the skin than upon the skin; some failed to induce tumors at the site of injection when injected subcutaneously but produced many pulmonary tumors; some produced tumors at the site of subcutaneous administration but failed to induce pulmonary tumors. Certain compounds were of high carcinogenicity for all tissues while others were weakly carcinogenic for all tissues. The dose administered, the route of injection, the solvent for the chemical, the strain and species of animals employed are all important factors in any study dealing with this phase of experimental cancer.

Another advantage obtained by the use of pure chemicals is the opportunity to perform quantitative experiments which are extremely important in biologic investigations. Efforts have been made to compare the carcinogenic activity of different compounds, but most of these have been performed by comparing the results obtained when a single dose of the carcinogens was injected. More thorough studies along quantitative lines are almost certain to lead to important findings. Emphasis should be placed upon obtaining more knowledge of the many available compounds.

Recent Work On Virus-induced Tumors

This trend in cancer research has been ably presented by Andrews⁷ and Rous.²⁰ The virus etiology of certain tumors in experimental animals has been generally accepted, but most investigators hold the view that so far as the causative agents of cancer are concerned the viruses represent only one of a number of etiologic factors. It is highly improbable that all types of neoplastic growths in all species are due to the activity of viruses. The foregoing discussion of the chemical carcinogens indicates that many tu-

mors may owe their origin to pure chemical substances which are incapable of reproducing themselves. In the final analysis any definition of a virus should include self-propagation.

Since this lecture deals with recent observations no effort is made to review this interesting trend which has been making progress for many years. Two of the most recent and interesting investigations will be discussed.

The first is the work of Beard⁸ and his associates at Duke University in connection with the virus of infectious papillomatosis in rabbits. This virus is easily detectable in the naturally occurring growths in cottontail rabbits but is seldom found in growth produced by infecting domestic rabbits. These workers attempted to ascertain why the virus is absent in the lesions of the domestic rabbit. They found that the virus is probably destroyed by an enzyme which is present in the tissues of the domestic but not in the cottontail rabbits. The implication of this observation is that a similar mechanism may be operating in the tumors of other species which may account for the inability of investigators to demonstrate the presence of infectious agents by the ordinary methods of transmission. A virus can disappear from the lesion after it has initiated changes which eventuate into malignancy.

The second recent contribution in this field was made by Duran-Reynals.¹³ His investigations were carried out with the well-known virus tumor of chickens. Time does not permit a detailed discussion of this valuable contribution and only a brief summary of the findings will be presented. Duran-Reynals found that the chicken virus was infective for newly hatched ducks and produced two types of lesions which he designated as immediate and late. The immediate lesions occurred within the ducks within 30 days after inoculation and could not be propagated in ducks but could readily be brought back to the chicken where it reproduced the typical chicken tumor. The late lesions, however, were found in ducks several months after inoculation and consisted of different types of tumors. These tumors could not be brought back to adult chickens but were readily transmitted to ducks. Thus, the variability of a tumor-inducing virus was established. Other series of experiments were performed which further demonstrated the extreme variability of the virus.

Duran-Reynals states that "the ease with

which, starting from the Rous virus, so many different strains of tumors have been obtained in ducks and chickens * * * weakens the objection often heard against the virus theory of cancer; namely, that one would be obliged to suppose that there is a different causative virus for every different type of tumor."

Only four definite trends in cancer research have been discussed, although it is recognized that others are of equal importance. The definition of trend as presented in the first part of this lecture precludes the mention of the work of any single investigator or any group of workers who may be interested in other important phases of experimental cancer. A development in cancer research is regarded as a definite trend when it is accepted as such and pursued in laboratories throughout the world.

Objections may be raised to the term "recent trends" applied to the subject matter of this lecture since some of the results were reported over ten years ago. It is essential to note that, as a rule, the most important advances in our knowledge of cancer have been the results of years of intensive effort by experienced investigators which indicates that in the study of the disease a period of ten years may be regarded as essential for the establishment of any definite trend.

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THE EVOLUTION OF MEDICAL PRACTICE

W. H. VALENTINE, M.D., F.A.C.S.

Tracy, Minnesota

I HAVE enjoyed and feel very deeply the honor the Southern Minnesota Medical Association has conferred upon me in making me its president for the past year. This is a society of rural practitioners, men of outstanding reputation in their own communities, generally known for their honesty, integrity, and professional ability. We should not be forgetful, however, of the fact that there is a generous sprinkling in this group of specialists who are well known not only in the United States but in the balance of the world as well. This mingling of general practitioners and specialists has brought about a very high type of medical practice in Southern Minnesota. It is an honor to me to be counted with these men of worth-while achievements and fine reputation.

The general practitioner gets closer to the hearts and lives of human beings than anyone else on earth. It is to him they go with all their troubles and sufferings; it is he who knows their weaknesses and strong points, their family characteristics and individual traits; and it is the family physician who successfully meets their mental kinks of whatever nature they may be. In special cases, where he has exhausted his professional facilities or ability, he refers the patient to a specialist, who, in his judgment, will give the most satisfactory care.

Since the beginning of time there has been disease and suffering and in the dawn of humanity disease was looked upon as evidence of displeasure of the Gods. In these early days the physician and spiritual adviser were very closely associated in the minds of the people and the spiritual adviser was often the one sought in time of ill-

ness. All kinds of fantastic sacrifices were made to appease this so-called anger of the Gods, such as the women of India throwing their babies into the Ganges river. We find even in Biblical times the reference to driving the demons of the insane from the people into the swine, and the swine rushing into the sea and being drowned.

May I call your attention to the fact that there still exists in the minds of not a few people the idea that some forms of sickness, especially the mental, have something to do with the unseen and the uncanny. Take, for instance, two persons who are sent to Rochester. One of them is sent on to the State Hospital for the mentally ill and the other to a surgical institution. After they both return home, the one who has been at the State Hospital does not himself, nor do his friends, refer to his Rochester trip. But the one who has had an operation is pleased to recite all the details at the club, at tea, or elsewhere. This is evidence of the hangover of the old mystery in medicine.

Then we have the magic, the contact with certain things or objects which are supposed to eradicate the suffering of the human being. There is not a professional man here tonight who has not had a man come into his office with a copper wire around his wrist to cure his rheumatism, or a stolen potato placed in his pocket to become hard with dehydration signifying the hardness being taken out of his joints.

All superstitions originated in the minds of primitive peoples, lacking any great amount of intelligence and practically illiterate, yet these superstitions have been blindly followed by men for centuries, most of whom enjoyed some degree

President's Address delivered before the Southern Minnesota Medical Association, Mankato, Minnesota, September 29, 1941.

of education. It is today more difficult to eradicate from intelligent and educated persons these absurd fallacies than it is to alter the erratic behavior of the insane. And, strange as it may seem, the doctor, in his efforts to aid mankind, finds superstitions one of the greatest handicaps when dealing with the sick. Friday is not unlucky because Christ died on that day; lemon juice will not remove freckles; handling toads does not cause warts; rubbing the warts with pork fat and burying the fat beneath a manure pile will not cure warts; the fact one is hungry does not mean he has a tapeworm. The old idea that human or animal urine had some certain healing qualities is not confirmed but is interesting when we consider that urine has been found to contain certain hormones.

I remember very well a man considerably older than myself who, when he was a boy, went to Dr. W. W. Mayo. At the time the young man was suffering from shingles. He said, "I understand if these go clear around me it will kill me." Dr. Mayo replied, "My boy, they will if they go clear around, but they'll not go clear around." We all know whiskey doesn't cure snake bites, and sulfur and molasses, or bicarbonate of soda, do not make the best spring tonics. Neither will bags of sulfur and asafetida, making the wearer smell like a tame polecat, keep away disease.

Fruits and seeds do not give us appendicitis. Cancer and tuberculosis are not inherited. Boils do not cleanse the system. Milk from the mother's breast squirted into the baby's sore eye is decidedly harmful to the eye and not beneficial. The hair of a mad dog rubbed into the wound will not cure hydrophobia. Yet we have intelligent well educated people today who will go to irregular practitioners of the art of healing in the expectation that the laying on of hands is going to cause marvelous and permanent cures in incurable diseases. This, of course, is another visible evidence of the weakness of the human race.

While medicine is as old as humanity and probably 5000 years ago there were many skillful things done in the treatment of bones, the trephining of the skull, and even herniotomies, the real medicine of today is a comparatively new art. Even we doctors are startled when we realize that within the last 75 years the principal achievements of medicine have been attained. Entering the three principal cavities of the body—the head, the chest, and the abdomen—and the

seeming impossibility of opening joints, were all made possible by two outstanding discoveries.

The first of these was the first use in 1846 of ether as a general anesthesia which enabled the surgeon to go about his work with deliberation and freedom of anxiety for the patient's suffering. Then the work of Pasteur and Koch brought out the relation of bacteria to infection which was fundamental to surgery and made it possible to have the highly perfected aseptic surgery we know today. It is within the memory of this society when laudible pus was looked for. Further, I remember very well Dr. H. M. Workman telling of spraying the operating room with phenol to kill the germs so he might eliminate the possibility of infection.

All this has brought about, in my estimation, the foundation for a most excellent type of modern surgical technique. Our modern hospital has a trained personnel, skilled nurses, elaborate laboratory facilities, and almost perfect x-ray apparatus. The discovery of x-ray is within the memory of the writer. One of the teachers came to me all excited one morning and said, "You know, they have a machine now that will take a picture of your bones while you are still alive!" Results from surgical procedure have become so satisfactory that when occasionally a patient dies following an operation the public asks, apparently very innocently, "What went wrong?" It does not seem possible to them that death could be caused by anything other than some surgical mishap.

Medicine, surgery, and hospitals grew up first in our large cities, but now in our small country towns we are finding well-equipped hospitals. These hospitals have a large investment and the attending doctors have contributed much time and money and are looking for returns. This equipment which does such wonders may at times cause some to be overzealous or not too conscientious so that operations may be done which are not absolutely necessary. The old saw about whether the surgeon operated for appendicitis or \$150.00 sometimes may be nearer the truth than we would like it to be.

With the pyramiding of financial investments, time and study necessary for a doctor's degree, there has been an accompanying increase in the cost of hospitalization and fees for the physician and surgeon. The lengthening out of the training period of the physician and surgeon has caused a certain amount of weeding out of the poor boy

who frequently looked upon the profession of medicine as his life's calling and has put this profession more or less in the hands of children whose parents are rather well off. This later class has never developed a sympathetic contact with the masses.

After having gone through this strenuous training to bring about the much desired dream of "Doctor of Medicine" the individual sometimes forgets the ideal that has been held out before medicine for many, many years—that of the patient first and the alleviation of human suffering. I fear sometimes the doctor feels he has invested a lot and must be paid for time and expense. This same condition may arise in our modern hospitals where expenses have become higher and higher each year.

Unusually high doctor bills and unusually high hospital costs have, in my judgment, been one of the causes of the so-called call for socialized medicine. We physicians sometimes, perhaps, have been guilty of being too conservative and inclined to feel that the practices of the past should be good enough for the present and also the future, and have not been willing to readjust many of our past practices to meet with the necessities of a changing civilization.

After all is said and done we must realize that of all the babies born in the United States, 50 per cent come into the homes of those whose earning capacity is less than \$1,000; may I repeat, 50 per cent of all babies born enter the homes of indigents or those individuals whose earning capacity is less than \$1,000 yearly.

I recently referred the small son of a school teacher whose earning capacity is approximately \$1,400 per year to one of our larger hospitals for a laparotomy. The first week's hospital bill on this patient was \$94.60; the next week's, \$73.80; and the surgeon's fee was \$200.00. In other words, for the two weeks' stay in the hospital this family paid out one-fourth of a year's gross earnings—more than 3 years' net earnings. This condition has made it possible for the news-monger to find fault with our medical practice.

It has become a popular thing to criticize medicine not only by the Bernard McFadden type of cheap publication, but in the August number of the *Kiwanis Magazine* there appears an article by the editor in which he stresses the fact that our people are not being taken care of as they

should be. In this article he states that in a certain town there were thirteen unnecessary deaths in one year due to the lack of hospital facilities—this in spite of the fact there was a modern hospital within twenty-one miles on a paved highway, a distance not much greater than that traveled in many larger cities by ambulance.

Statements of this kind for lay consumption in this magazine, in my judgment, should not be allowed to go unchallenged. I, therefore, took it up with the editor and he referred me to the physician who was in charge of this hospital which is located in the hinterlands of Missouri. These people are ignorant, superstitious, and very poor. The doctor in charge writes me as follows: "The people who died in my community while I looked on and counted them did not do so because we failed to urge hospitalization but because the individual or people responsible for him could not bring himself to meet the situation. It is our thesis that if hospitalization is stripped of the non-essentials and the hospital located close to the rural individual so that he will be acquainted with it he will make use of the hospital. Moreover, experience has shown us that he can pay his own bill and not become a ward of society on a general scale."

"Our contention here is that the community more often has wanted to dump the medical problem in the lap of the doctors and with great moral emphasis accuse the doctors if they fail to assume the whole responsibility for the arranging of the financial obligation incurred. It seems to me that the mass result of this situation has been for the doctor to find himself finally unable to assume the responsibility as it is offered to him, so that the public has howled to the government to do something about it. Our deepest sympathy is with the public, but we believe it is a spoiled child."

The *Atlantic Monthly*, which we will all grant is a high type magazine, had an article in the April number a few years ago by some unknown writer who was a college graduate. She displays many queer psychological quirks in her article entitled, "I Had a Baby." She raves on about the high cost of this procedure. At the same time she honestly admits she obtained the services of one of the most expensive obstetricians in New York City and had everything the hospital could offer; then strenuously objects to what it cost her. This is like going to an expensive hotel and after-

wards figuring you could have had lodging cheaper elsewhere.

She criticizes everybody in the medical profession and finally decided to go to Switzerland to have her next baby because she said the doctor insisted on her taking an anesthetic. Now, truly, lay readers would think from this article people are being grossly overcharged.

However, in the June *Atlantic Monthly* there appears a symposium in which three level headed women go on to state they had their babies in American hospitals, had fine service, everything was satisfactory, and they were allowed many chances to have what they wanted—for instance, could have an anesthetic or not just as they liked.

In last Sunday's issue of one of our prominent religious papers we find the heading "A Woman Complains About Doctor's Fees" calling the reader's attention to how reasonably our grandmothers received obstetrical care in the past, yet now with more doctors and cars, good roads, they have to sell two of their herd of ten cows to pay for the youngest baby and still don't have enough money. The editor very thoughtfully remarks that the doctor with his modern education and facilities, the hospital with its full equipment are offering their obstetrical services for a very reasonable amount. As stated by the editor, it is not uncommon for all prenatal, delivery, postnatal care, and hospital fees to be furnished for \$50.00.

We are surprised to find in the *Atlantic Monthly* of some time ago an article by Dr. Henry E. Segerist of the Institute of History of Medicine at Johns Hopkins in which he criticizes the practice of medicine in the United States. He names a lot of countries in Europe and tells how much better medicine is handled there. He states among other things that more than 40,000,000 of our population have an income of less than \$800 a year; that the other third does not have \$1500 a year. He further states that in millions of families whose income is more than \$1500, medical care presents a most serious problem.

He goes on with a great deal of statistical freedom showing how people die of tuberculosis, cancer and heart disease and would leave the reader to believe, or reach the conclusion at least, that if we had social medicine all these people would have lived which, of course, is the farthest thing from the truth. After reading the article, if one believes everything said, he will believe we are having hundreds of unnecessary deaths from the inefficiency of the present medical setup.

Beverly Smith, writing in the *Readers' Digest* under the heading of "Diagnosing the Doctors," goes on with very startling figures that would send a cold chill into the heart of any individual. She states that 7,000 women die in childbirth every year; 70,000 children die in the first year; 20,000 die of pneumonia, etc.; that there are about 600 needless deaths each day, supposedly proving that if we had doctors working on a salary these deaths would not have occurred. She infers that all the doctor of today is after is money. She says that if a judge could decide a case one way and get \$5000 or decide it the other way and get nothing which way, she asks, would he naturally decide? She quotes our good friend Richard Cabot as being in favor of salaried physicians. Incidentally, I happen to know Dr. Cabot, as you probably do also, and I know he had a wife with a million in her own name which might help out his salary.

This country has developed over the last three centuries from a sparsely inhabited strip along the Atlantic seaboard to a teeming nation of 130,000,000 souls spread across this vast continent. We have been born with gold spoons in our mouths, pampered until we are not willing to put up with anything that does not conform to our own narrow beliefs. Imagine a nation with only 6 per cent of the world's area and 7 per cent of its population owning 33 per cent of its railroads, using 48 per cent of its coffee, 56 per cent of its rubber, owning 60 per cent of its telephone and telegraph lines, consuming 70 per cent of its oil, 72 per cent of its silk, using 80 per cent of its motor cars, having one-half of its monetary supply, fifteen billions in gold, and two-thirds of its banking resources, and yet, due to obvious maladjustments, discontented and, in many quarters, bitter.

Discontented ourselves, we have in turn become the cause of discontentment elsewhere. Not so long ago the Brazilian Ambassador ascribed the growth of fascism in his country largely to the bitterness engendered there by the fact that American labor had twenty times the income of Brazilian labor. Discontented ourselves, we are of all nations the most envied. All too many of us have very little real conception of the nature of liberty. We like to declaim about "our ancient liberties," and fail to remember that liberty, in its higher aspects at least, is not an inheritance to be handed down by operation of law from generation to generation.

We fail to realize that liberty is something that must be positively and aggressively achieved by each successive generation or else be lost to that generation, and probably to its successors. One of the great grounds of discontent today is that liberty, freedom, and civilization are not automatic. We resent the fact that we, like our forefathers, must fight in our day for freedom. Is it not obvious that what is most needed today in this enormously rich but very discontented country of ours is a clearer perspective on life as a whole? True, there are doubtless many things that need correction, medicine as well as everything else. Manifestly, the millenium cannot be reached overnight. Perfection is not to be attained by legislation. What is needed now, above all things, is unselfish, enlightened civic leadership.

The present discontent with the medical profession is just one of the many outbursts of discontent in many different walks of life. But medicine seems more vulnerable to the attacks of the agitator because within its folds we can find a great deal of sentiment which has within itself the possibilities of very lasting appeal.

The physician—first on horseback, then with his horse and buggy, more recently with his automobile, and now occasionally, in emergencies, with his airplane—has placed his skill and his devotion to duty at the service of his community. Suffice it to say that our nation and our time has been better served by its physicians than has any other nation at any other time.

In 1901 the expectation of life at birth in the country was 49.24 years. By 1941 it had advanced to 63.42 years. In short, every citizen owes at least one-fifth of his years of expectancy of life to the advances of medical science in the last half century, not to mention a much more comfortable living throughout his whole span of life. Here is a record that one would think would have endeared the medical profession to every sane person. Yet a small minority are bitterly misrepresenting and fighting us.

"Illness is a hazard of such unpredictable incidence that it cannot be budgeted in advance like most of the necessities of life. It is more disastrous than other hazards because it imposes a double penalty. It deprives the wage earner, at least, of income just when it is most needed to meet the costs of medical care. It is to meet the needs of this great middle class that cost-sharing methods have been devised."

Workmen's compensation is not only a return of a part of the salary to the disabled worker but also pays for his medical care and hospitalization. It does not extend to the care of the family when they are ill. Unemployment insurance does not cover medical care. Unemployment from the lack of a job, and unemployment due to the fact the individual is laid up from illness are much the same, so we might have unemployment cover not only loss of wages due to failure to find employment but also due to the failure of employment brought about by illness.

Writers seem to have run away with the idea that services rendered by the general practitioner are of little or no value. We must have groups of specialists in order to take care of ordinary sicknesses. As a matter of fact, in my judgment, the group is not as capable of taking care of ordinary illness as is the general practitioner. The individual who is coming down with an acute attack of influenza does not need the services of an eye, ear, nose, or throat specialist nor a brain surgeon. If we are going to insist that everybody is going to be taken care of by a group of men who are trained in specialties it is necessarily going to double or triple the medical cost of any trivial illness.

Group medicine is only necessary in cases that are especially selected by the general practitioner which he cannot take care of for one of two reasons: (1) he does not have the special equipment to make the necessary diagnosis or administer treatment; or (2) the condition is so rare that only a few men after long study are able to make diagnosis and give treatment.

We should not be too greatly shocked by the fact that a great deal of sickness is now being delegated to governmental control. We have already, and I think all believe satisfactorily so, allowed the State Board of Health to look after contagion, the County Board to care for our tuberculous patients, and the State Board of Control to care for the insane, and crippled and deformed. During the passing years there has been a gradual extension of federal agency into health activities; the United States Health Service is in the Department of the Treasury; foods and drugs in the Department of Agriculture; maternal and child welfare in the Department of Labor; the care of Indians and insane in the Department of Interior; the Medical Corps of the Army and Navy with their own establishment; the care of the veterans in the Veterans' Admin-

istration; the care of the indigent farmers in the Resettlement Administration; and so on through twenty-seven different federal agencies involving an expenditure of approximately \$600,000,000 a year.

The exponents and agitators of State Medicine have charged that the medical profession is static and obstructive, but without any compulsion from political or government sources the profession has sought constantly to advance the standards of medical education, medical licensure and hospital practice, and is now making a notable progress in the certification of specialists. Medicine has always been its own most severe critic and has done everything possible to raise the standard of medical practice.

A Municipal Employees' Health Service System was tried in San Francisco. This service was started some years ago and its success thus far had been due to the coöperation of the medical society and its members in the face of constant difficulties. In March 1941 the physicians reported feeling the crack of the politician's whip with the result that hundreds resigned in protest. The actions of the lay board seemed to be the foundation of the whole trouble; when the board was called together to consider the trouble only three of the eight directors met. It is the old story of lay people who know nothing about medicine attempting to dictate to medical men.

In a recent survey made by the American Medical Association, one-fourth of the physicians in active practice in Minnesota reported having given free care to 101,525 patients. Assuming the balance of the 3,302 physicians in the State gave an equal amount of free service, 10 per cent of the total population would have received care without paying. Who knows of anyone who is seriously ill and has no physician in attendance or cannot obtain the services of a reputable man?

There is a marked tendency to paternalism in government. Children's play must be supervised, tennis courts must be marked for them; young

people are unable to entertain themselves individually without some outside aid to give them the desired thrill. Boys and girls when they reach maturity expect some unseen hand in the form of government supervision to take care of their illnesses, give them a good job, and a good home.

During the present emergency we are becoming more aware of the privilege of living in a democracy and become much concerned when we realize there are but two great democracies left. We know that since the beginning of recorded history the masses have struggled for the right to live as free people. During the first third of the present century a larger share of the human race enjoyed freedom than in any previous period of history. Today we find progress has been reversed—more people have been subjugated during the past two years than during any similar period in history.

We are increasingly aware of the fact that we must be on guard if we are to preserve our democratic way of life. During the past, people have thought in terms of the privileges which democracy offers. If democracy is to be preserved we need to gain a greater appreciation of what democracy really is, how it may be improved, and how we may better serve this society in which we live. We need to become aware of the fact that if we are to have privileges we must also assume responsibilities.

Will organized medicine, by offering coöperation, aid in the development of a comprehensive plan of medical service, or will it wait until some system is imposed upon it where the effects can only be removed by years of continuous struggle?

Knowing the medical profession as I do, I have faith to believe that it will arise to this emergency as it has done in the past, and carry on successfully with honor to our beloved profession.

SHARK LIVERS PROMISE NEW VITAMIN SUPPLY

There will be plenty of vitamins for babies in Australia even if the reported mass drive to the altar by American soldiers and Aussie lasses causes a sharp uptrend in the continent's birth rate.

The Australian News and Information Bureau reports that a new process discovered by an Australian firm will guarantee ample supplies of shark liver oil, rich in vitamins needed by infants.

Eighteen months ago when vitamin oil imports from Newfoundland and Great Britain were plentiful, the shark livers were discarded. Today they are the center of a new industry promising to keep infants healthy and fishermen employed. Fish liver oils are rich in vitamins A and D.—*Science News Letter*, April 11, 1942.

PROGNOSIS IN HEART DISEASE: CONTRIBUTIONS OF THE ELECTROCARDIOGRAM

JOSEPH F. BORG, M.D.
Saint Paul, Minnesota

THE past decade has seen the development of a vast fund of information concerning the electrocardiogram. Unfortunately the dissemination of this knowledge proceeds all too slowly, and, as in many other fields, its use by the profession lags by many years behind its discovery. Thus it is a matter of importance to occasionally review the rapidly accumulating information available for study and to ascertain what practical use can be made of it.

Much attention has been paid to the electrocardiographic findings which aid in the diagnosis of heart disease. Hand in hand with these are to be found many observations which have great value prognostically in the study of the heart patient. Experience teaches that one must always be guarded in the expression of prognosis, a hazardous matter at best, but electrocardiographic findings will often enable the inquiring physician to evaluate more accurately the risk the patient is carrying and to forecast a course of events otherwise unsuspected.

The electrocardiogram may offer information of prognostic value in two general ways. First, the findings noted in the record will often reveal much more accurately the nature of the underlying heart condition, and the elimination of any doubt in this respect will enable one to assuredly express that prognosis which clinical knowledge has already made available to us. For example, an exact diagnosis of a cardiac rhythm disturbance enables the physician to obtain a much better concept of the gravity of the underlying condition and may give valuable warning as to the future course of the disease. Also, we have come to learn much of prognostic value from the recognition of certain changes in wave conformation, voltage, and lead combinations. Observations of these findings and certain combinations of them which may be considered as syndromes of electrocardiographic changes have come to be recognized as important, not only from the standpoint of diagnosis but also from that of prognosis. The purpose of this report is to discuss the importance of these considerations as a

guide to the knowledge of what the future holds for the heart patient.

A bradycardia above fifty per minute is usually of no significance but occasionally there is found an unsuspected complete heart block with its attendant significance. Below fifty per minute it may be of no significance, but more often it is found due to auriculoventricular block, nodal or other abnormal rhythm, or toxic disturbances. Here the prognosis is that of the underlying condition which often depends on the electrocardiogram for recognition.

Sinus arrhythmia is not associated with heart disease but may be so marked as to suggest the possibility of a more serious type of disturbance such as auricular fibrillation. Here the electrocardiogram is necessary to determine its nature and avoid the more serious prognosis which attends an inaccurate diagnosis. In acute infections this type of rhythm usually disappears with an elevation of the pulse rate. It has been observed that in such conditions where the sinus arrhythmia returns during convalescence, the myocardium has probably escaped injury.

The determination of exact information concerning premature contractions can be of great importance in informing the physician concerning the gravity of a particular situation. These common arrhythmias are usually ventricular in origin and often of no significance clinically. When they occur in regular sequence, such as in pulsus bigeminus or trigeminus, they are usually indicative of heart disease when digitalis toxicity can be excluded. Occasionally they may be accompanied by a tendency to ventricular tachycardia and at times to ventricular fibrillation, usually fatal. Where the premature contractions are auricular in origin, they are frequently precursors of auricular fibrillation, definitely of more serious prognostic import. When they are found to be of multiple foci of origin, ventricular, auricular, nodal, or combinations, the underlying condition is an irritable myocardium often associated with a myocardial damage of seriousness otherwise unsuspected. Where numerous premature contractions are associated with arteriosclerotic heart disease, the progressiveness of

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the latter is emphasized and points to a much more ominous situation than where the condition is stationary.

Paroxysmal tachycardia are common disturbances of rhythm which originate in the auricles or ventricles, in the ratio of about four to one. The immediate outlook as regards the paroxysm is good regardless of the rate, duration, or apparent illness except (1) in the ventricular type which may switch to the fatal ventricular fibrillation, (2) when associated with a failing heart where fatigue may cause a fatal outcome and (3) when found in association with acute myocardial infarction, where the ventricular type is often found and where it may produce congestive heart failure. In these a guarded expression of future possibilities is the wise course to take.

Campbell and Elliot² found that 55 per cent of paroxysmal tachycardia problems are found in normal hearts, 19 per cent in rheumatic heart disease, 20 per cent in hypertension and coronary heart disease, and the rest scattered. In the normal hearts the attacks seemed to have no significance prognostically. In the rheumatic group they did not seem to influence the length of life. In hypertension and coronary heart disease one-half the patients died between five and ten years after first seen. When paroxysmal tachycardia is nodal in type, it usually has the significance of the auricular type, many of which are not associated with organic heart disease, being of vagal origin and being reversed by atropin administration. Where such reversion does not occur, the disturbance is probably associated with myocardial disease.

Auricular fibrillation is usually, but not always, diagnosed without the aid of the electrocardiogram and in itself has certain prognostic significance. If found without other evidence of heart disease, it is usually transient and the prognosis good. Where other indications point to heart disease the presence of auricular fibrillation indicates important damage. It may suddenly appear in the course of acute myocardial infarction and indicate grave danger. Embolic complications may cause sudden death. However, it is hazardous to attempt to estimate the duration of life following its onset. The majority of patients die within ten years of progressive myocardial damage. It has been pointed out that auricular fibrillation, complicated by ventricular premature contractions, is accom-

panied by a definitely more serious prognosis. DeGraff and Lingg⁴ showed that in rheumatic heart disease where auricular fibrillation set in before the age of twenty, the expectancy of life was less than one year. In older age groups this is not true, other factors being more important in determining the outlook.

Axis deviation in itself is usually not of great significance, but where recognized heart disease exists, it is indicative of a greater strain on the heart. Thus, right axis deviation in mitral rheumatic heart disease lessens life expectancy as does also left axis deviation in diseases causing an enlargement of the left ventricle.

The presence of right axis deviation associated with myocardial infarction is usually an index of a severely damaged left ventricular myocardium, often associated with extensive destruction.

Masters¹² has presented a prognostic study of right axis deviation in 173 patients over a period of four years. Fifty-seven percent of these had chronic valvular disease, of whom 28 per cent died, the poorest prognosis being among those who showed inversion of T waves in leads one and two. Twenty-one per cent of this group had degenerative heart disease, of whom 7 per cent died, all of whom had wave changes in leads two and three. Of all types, 21 per cent were dead in four years, and where associated with auricular fibrillation 33 per cent were dead in that time.

Klainer¹⁰ found in a study of arteriosclerotic and hypertensive heart disease that right axis deviation was often associated with recent myocardial infarction and that 43 per cent were dead in one month after discovery. He also found that 83 per cent were dead twenty-seven months after the condition was discovered and that the average duration of life was seventy-six months.

Many electrocardiographic changes add nothing to exact clinical diagnosis of etiology in heart disease, but they have been found to contribute to the understanding of the gravity of a situation and thus to prognosis. T wave negativity, various grades of heart block, low voltage, pulsus alternans, and changing serial records are among these changes.

T wave negativity has been well studied by many observers. Willius¹⁶ showed that in patients with heart disease, those having T wave changes had only about half the life expectancy of those without them. Of 200 cases of rheumatic aortic insufficiency without T changes, 39 per cent were dead in sixteen months, while in

sixty-two cases with T changes, 56 per cent were dead in four months. Of 137 cases of syphilitic aortic insufficiency without T changes, 46 per cent were dead in sixteen months, while of forty-two cases with T changes, 76 per cent were dead in eleven months. Of 272 cases of coronary disease with T wave negativity, 67 per cent were dead in seventeen months. This experience was similar in hypertensive heart disease. In both types of degenerative heart disease the more T waves are inverted, the poorer the outlook.

While the findings indicate that T wave changes are significant of serious heart disease, it must be emphasized that such mortality experiences may be materially altered by the more meticulous care with continued observation which should be given to patients with significantly serious electrocardiographic findings. In the hands of many physicians, therefore, this mortality may be considerably lower.

Conduction defects in the absence of toxic etiology are nearly always due to serious heart disease. They are usually unfavorable signs. Their prognosis depends on their severity, their duration, and their tendency to progress over a period of time, but an important determinant, also, is the nature of the underlying heart condition. In the severer grades of disease there is danger of cardiac standstill (Adams-Stokes Syndrome), unpredictable and often fatal. Most individuals with these grades of severity live less than two years from the time of their discovery. In acute infections, as diphtheria, these defects are signs of cardiac involvement, toxic or inflammatory. They are dangerous during the acute condition, but usually heal completely and leave no disability.

Intra-auricular block as seen in wide, notched, tall P waves is due to myocardial disease importantly involving the auricles. In itself it has no independent prognostic importance save that it is frequently the precursor of auricular fibrillation.

Auriculoventricular block is always a serious condition warranting a guarded prognosis. The prognosis is that of the etiologic factor in addition to the inherent danger of sudden, unexpected death, associated at times with shifts in the grade of block, due to ventricular standstill. In coronary disease the outlook is poor.¹¹ In acute myocardial infarction it is a very ominous sign, five patients out of thirteen in one series⁹ having died. In luetic or rheumatic heart disease the

prognosis, although guarded, is less serious and patients may carry on for long periods. While auriculoventricular block occurs too infrequently for statistical analysis, it must always be considered a serious sign and a guarded prognosis maintained.

The third important type of block is intra-ventricular or bundle branch block, by far the most common. Here considerable light has been thrown on the prognosis through a number of studies. This type of block may be roughly divided into five groups, the common, uncommon, concordant, S and miscellaneous types. While most investigators have been unwilling to attribute any difference prognostically to the individual groups, recent work has shown that at least two types have quite different prognoses than the others. Willius⁵ has shown the S type to have much better prognosis than the more common types. Also, it is becoming known that an unusual type in the miscellaneous group must be recognized and separated as one which is not apparently due to heart disease, a type associated with a short P-R interval and attacks of paroxysmal tachycardias.

However, it must be recognized that the great majority of cases fall in groups which have similar significance prognostically. Sampson¹⁴ made a study of 112 cases of bundle branch block. He found that at the time of discovery of the lesion a patient has a 20 per cent chance of surviving eleven years. If he survives three years, he has a 44 per cent chance of surviving eight years. In the common type of bundle branch block there is a higher mortality than in the uncommon and miscellaneous types. In the patient with a changing electrocardiogram there is a definitely poorer outlook than where the record is stationary. The highest mortality is always found in the first year.

Comeau³ and his associates in discussing transient bundle branch block point out that it is usually associated with coronary sclerosis, the outlook depending on the progress of the disease which is determined by the clinical picture as well as a changing fundamental electrocardiogram.

Bishop and Carden¹ studied the prognosis in bundle branch block in a series of fifty cases. They point out that it is the same in complete as in incomplete block. They found the mortality to be highest in the first few years after discovery. Thirty per cent died in the first year, 15 per

cent in the second year, 10 per cent in the third year, and eight per cent in the fourth year. With each year of survival beyond the fourth the expectancy of life increased. Five patients of their series were alive after a known duration of eighteen to twenty years of intraventricular block.

Kaplan and Katz⁷ state that 60 per cent of the patients who die with intraventricular block are dead within two years. Of these 80 per cent died during the first year (27 per cent in the first three months), and 90 per cent during the first two years. Forty per cent of their series were alive two to eight years after discovery of the block. They conclude that if the patient survives the first year after discovery of the block, the prognosis is good.

Master, et al.¹³ have shown the seriousness of bundle branch block in acute myocardial infarction. In his series there was a mortality of 43 per cent, almost double that found where normal conduction occurred. In these deaths autopsy always showed previous closure of one or more branches of the coronary arteries. The outlook was not related to the type of bundle branch block which was found. An increase in mortality occurred where QRS was greater than .14 seconds, and most of the deaths were associated with myocardial failure. Also, the danger of ventricular fibrillation is increased by the presence of intraventricular block in cases where digitalis leads to ventricular extrasystoles.

In general, it should be emphasized that studies of bundle branch block can give much information concerning the prognosis of heart disease in which it is found. This is especially true if care is taken to classify this conduction defect since certain types have quite a different mortality than others. Early after the recognition of the defect it is hardest to derive information as to prognosis, but since the first year mortality is always high, patients surviving this period have a relatively good outlook, their condition frequently remaining fairly stationary and amenable to clinical control.

Alteration of the heart is an infrequent form of heart block recognized as pulsus alternans or electrical alternans. It is a condition in which a local region in the heart is partially or completely blocked out with every beat.⁸ It may be transient, recurrent, or temporary. Prognostically, when associated with tachycardia, it is of no significance, but when occurring at slow rates it is in-

dicative of organic heart disease, especially coronary sclerosis. Infrequently the types of alternans occur together. More often one or the other may occur. They have the same significance prognostically, and where the alternans persist, the patients usually do not live more than a year or two.

Low voltage has long been considered to be associated with serious myocardial damage. This is measured by the greatest deflection of the QRS complex in the standard leads and is regarded as existing where the highest QRS deflection is five millimeters or less in each of the limb leads or where it is somewhat taller than five millimeters in one lead with the sum of all amplitudes less than 15 millimeters. It may or may not be associated with low voltage in the chest leads. Many conditions amenable to treatment such as hypothyroidism, myocarditis, pericardial effusion, etc., may produce low voltage in addition to coronary disease patients which comprises the largest groups. It is, therefore, important to arrive at a correct clinical diagnosis before attempting to read significance into the electrocardiographic finding of low voltage.

Sprague and White¹⁵ studied fifty-seven cases of low voltage and found that they were usually associated with arteriosclerotic heart disease (thirty-four cases) or hypothyroidism (ten cases). Of the arteriosclerotic group only one-third were known to have been alive, and all of these were last contacted less than three years after the low voltage was found. Those who died had all lived less than two years after its discovery. Occasionally, but rarely in arteriosclerosis, the voltage may return to normal limits under therapy with a definite improvement in the outlook. This suggests an improvement in the myocardial blood supply associated with a compensating collateral circulation development.

The low voltage discussed has concerned the QRS deflection. This may or may not be associated with low T waves and is more significant where the T waves are low, less than two millimeters deflection in all limb leads. T waves are frequently low in one or two leads without significance. This is especially true in lead one associated with a low QRS complex. Such a finding is common in the vertical type heart and is of no clinical significance. Where R₁ is high and T₁ is low and where T is low in all leads, strong evidence of heart abnormality exists.⁶ Knowledge concerning the prognostic significance of

these findings is not definite and must be obtained from knowledge of the clinical condition toward which the record is an aid in recognition.

The past decade has given the medical profession a new conception of the value of the electrocardiogram in conditions associated with changes in the myocardium, toxic or organic, transitory, progressive, or stationary. While much of the value is diagnostic, considerable of prognostic import is included and is especially provided by serial records at varying time intervals. Such records point out the evidence of toxicity due to digitalis medication and enable one to be on guard against symptoms which might be overlooked as being due to the medication. They are helpful also in showing the course of myocardial involvement in infectious disease, usually returning to normal during convalescence. The delay of such a return or failure to appear may be the only evidence pointing to continued or progressive myocardial damage which impairs the outlook for recovery.

The greatest value of the electrocardiogram is in the management of coronary heart disease. Here serial records cannot be overemphasized in the importance of their contribution to prognosis. Normally the tracings are characteristically stationary for an individual and deviations from the normal are indicative of myocardial change. In coronary disease these changes are especially helpful in giving information concerning the myocardial involvement. Often coronary disease produces a myocardial effect which becomes stationary at some point, this being demonstrated by the fact that the electrocardiogram shows no change in serial records. In other instances the progressive narrowing of the coronary arteries causes progressive myocardial changes which are reflected in the changing pattern of the electrocardiogram. These changes point prognostically to a serious type of heart disease with a definitely limited life expectancy. They may develop into some of the types previously discussed which in themselves have certain prognostic significance as shown from statistical analysis. Then again they may become stationary at any point as the process ceases to progress. Finally, though not usually, they may show a definitely improved outlook as a collateral circulation develops, especially under conditions of a long period of rest and restricted activity.

In acute myocardial infarction the serial electrocardiograms are of greatest importance in management of the disease. Not only may the type of curve indicate the severity of the initial damage, but the rapidity with which the serial tracings tend to stabilize at their eventual contour is of great value in determining the length of time absolute rest is advisable. During this rest period, as well as in the later convalescence, many of the previously described ominous features of the record may be found and point to danger which should be recognized and which may at times be lessened by proper management.

In conclusion, it is hoped that a useful concept of the value of the electrocardiogram in prognosis has been presented and that its limitations have been properly stressed. Considering the electrocardiograph from this point of view only emphasizes the warning of Katz⁸ that it "is not a tool for the unscrupulous or a plaything for the erudite. . . . Its value depends as much on the ability and experience of the cardiographer as the results of clinical examination depend on the ability and experience of the clinician. . . . It is as much of an error to expect too much from this tool as to ignore the valuable information that it can give."

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ECTOPIC PREGNANCY

An Analysis of 102 Consecutive Cases

WM. P. SADLER, M.D.†
Minneapolis, Minnesota

DURING the nine-year period, 1932 to 1940, 102 proved cases of ectopic pregnancy were admitted to the Minneapolis General Hospital. Data selected from these cases furnish the material for this study. Findings, in the main, conform to generally accepted concepts though they differ in some particulars. During this same period 7,720 patients were admitted to the gynecologic service, 15,223 to the obstetric service and 2,532 abortions were recorded. This totals 17,765 gravid women.

Our incidence is one ectopic pregnancy for approximately every seventy-six gynecologic cases, one for every twenty-five abortions and one for every 174 intrauterine pregnancies. Schuman estimated the incidence in the Philadelphia area as one to 303 uterine pregnancies.

A survey of the literature shows considerable variation in the total and operative mortality rates. Table I illustrates this more clearly.

In 588 cases including ours, the average total mortality is 5.4 per cent and the operative mortality 2.93 per cent. One hundred of our patients were operated upon with one death (1 per cent), which occurred seven days after operation. Autopsy revealed bilateral lobar pneumonia. Of the two non-operative deaths, one occurred en route to the operating room three hours after admission. Autopsy showed a ruptured cornual pregnancy with massive intraperitoneal hemorrhage. The other death was in a patient who had attempted to abort herself. She was diagnosed and treated by us as a septic self-induced abortion. She died fourteen days after admission. Autopsy showed infected tubal pregnancy with rupture into the ileum, *B. coli* septicemia and multiple lung abscesses. *B. Welchii* was cultured from the spleen.

Our favorably low total (2.94 per cent) and operative (1 per cent) mortality is especially noteworthy because of the large percentage of shock cases in this series. Twenty-eight patients (27.4 per cent) were admitted in varying grades of

TABLE I

Author	Place	No. Cases	Total Mortality	Operative Mortality
Lavell	Bellevue, N. Y.	410*	—	2.68%
Scheffey et al.	Phila.	82	4.87%	2.5 %
Ware and Winn	Richmond, Va.	150	8.00%	5.41%
Schauffler & Wynia	Portland, Ore.	65*	—	3.0 %
Thompson	Baltimore U. of Md.	40	7.5 %	—
Grier	Evanston	100	3.0 %	3.0 %
L. Miller	Phila. Gen'l.	104	6.7 %	—
Our cases	Mpls. Gen'l.	102	2.9 %	1.0 %

Average total mortality in 588 cases—5.4%
Average operative mortality in 909 cases—2.93%

shock, three mild, seven moderate, ten severe and eight practically moribund. The average incidence of shock reported in the literature is approximately 15 per cent. Langman and Goldblatt had 15 per cent in their series; Ware and Winn, 17 per cent. These conform to the findings of others. Lavell's series showed an incidence of 21 per cent. Two factors contributed to our results. These were prompt surgical interference and the use of an available blood bank. Two moribund patients received 3,600 c.c. and 4,000 c.c. of blood by transfusion within a period of several hours.

That the diagnosis of ectopic pregnancy presents many difficulties may be seen in Table II.

Definite diagnosis was made in sixty-six of our cases, suspected in twenty and missed in sixteen. Cases in this series with the diagnosis "Probable ectopic pregnancy" and no other qualifying diagnosis were listed as suspected. More liberal interpretation of these would give us a correct diagnosis in 72.3 per cent. In the presence of shock, the diagnosis presented little difficulty. Of these, twenty-seven of the twenty-eight were correctly diagnosed. The one missed entered the hospital the day after she had

Thesis presented before the Minnesota Academy of Medicine, March 11, 1942.
From the Department of Gynecology, Minneapolis General Hospital.
†Lieutenant Commander, MC(V)S-U.S.N.R., Norfolk Naval Hospital, Portsmouth, Virginia.

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TABLE II

Author	Place	No. Cases	Correct	Suspected	Incorrect
Lavell	Bellevue, N. Y.	261	84.7%	—	15.3%
Scheffey	Phila.	82	78.7%	—	21.3%
Ware & Winn	Richmond, Va.	150	40.0%	13.0%	47.0%
Schauffler	Portland, Ore.	65	80.0%	—	20.0%
Thompson	Baltimore, U. of Md.	40	37.5%	22.5%	40.0%
Grier	Evanston	100	78.0%	8.0%	14.0%
Lisa	N. Y. Wel. Island	115	54.3%	—	45.7%
Our cases	Mpls. Gen'l.	102	65.6%	19.6%	14.8%
Average		915	64.6%	7.9%	27.3%

visited a criminal abortionist and was admitted with a catheter in situ. Our diagnosis was ruptured uterus and peritonitis. Operation revealed a ruptured cornual pregnancy with massive intraperitoneal hemorrhage.

It is interesting that our percentage of correct diagnoses was practically the same as the general average of the 915 cases shown in table number two.

Race, Age, Marital State and Parity.—There were one hundred white women, one colored and one Mexican. The age ranged from eighteen to forty-three years. Two were eighteen, one forty-one and three forty-three. Twenty-one were between twenty to twenty-four years, thirty-six between twenty-five to twenty-nine years, twenty-nine between thirty and thirty-four years, ten between thirty-five and thirty-nine years. The decade of twenty-five to thirty-four years showed the largest number, sixty-five or 63.7 per cent. Eighty-eight of the patients were married, nine were single and five were divorcees. Incidence in relation to parity shows the largest group, twenty-five, had been pregnant once previously, and thirteen had never been pregnant. The number of pregnancies ranged from two to eleven in the remaining sixty-four patients. Five patients in this group had been operated upon for ectopic pregnancies. In one operated elsewhere, the distal half of the tube was removed. At this operation

TABLE III. TIME ELAPSED SINCE LAST PREGNANCY
(Seventy-nine cases)

Years	No. Cases	Years	No. Cases	Years	No. Cases
1	17	6	5	12	1
2	14	7	6	13	1
3	13	8	2	15	1
4	10	9	4	17	1
5	4	10	0		
79 cases—100%		21 cases—Period of relative sterility ranging from 6-17 years.			

the ectopic involved the proximal portion of the same tube.

Relative Sterility.—Of eighty-nine patients with previous pregnancies, the time elapsed since the last pregnancy was recorded in the history in seventy-nine cases. This is shown in Table III.

A period of relative sterility is minimized by many authors. Its occurrence in 26.6 per cent of our cases ranging from six to seventeen years seems significant.

Duration of Pregnancy, Site and Condition.—One of these pregnancies was a secondary abdominal pregnancy at eight months. Another was an intraligamentous pregnancy at twenty weeks. The remainder were fourteen weeks or under in duration. Pregnancy occurred in the right tube fifty-nine times and forty-two times in the left. Of these, three were interstitial with two located on the left and one on the right. Wynne found an incidence of 1.5 per cent in 1,547 cases. Our incidence of 2.9 per cent is relatively high. Recently Lisa reported an incidence of 6.3 per cent in 115 cases studied. The history gave the portion of the tube involved in seventy-eight of the 100 cases operated upon: thirty-two were in the ampulla, seventeen in the isthmus and three were interstitial. The distal half was involved in ten cases, distal two-thirds in six, and the whole tube and ovary in five. The remaining five were intraligamentous. Rupture posteriorly between the sheaths of the broad ligaments is exceedingly rare. Its occurrence in five of our cases (6.4 per cent of seventy-eight cases) is extremely high.

At operation seventy-one were found ruptured,

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TABLE IV. PREGNANCIES PREVIOUS TO THIS ECTOPIC (89 CASES—239 PREGNANCIES)

No. Pregnancies	Termination	Per Cent
170	Del. at or near term	71.13
49	Aborted	20.5
15	Premature	6.28
5	Previous Ectopics	2.09
239 pregnancies—100%		

thirteen unruptured and sixteen were tubal abortions.

Previous Laparotomy and Pelvic Infection.—Thirty-two (31.3 per cent) of our 102 patients had undergone thirty-eight previous laparotomies. Scheffey, et al, Schauffler and Wynia, and Langman and Goldblatt found a high incidence in their series. This finding in almost one-third of our cases supports the observation that previous lower abdominal surgery contributes to the incidence of ectopic pregnancy.

Previous pelvic infection as an etiologic factor has been stressed by many observers. Its incidence by history in thirteen patients (12.7 per cent) is low. Histologic examination confirmed the low history rate. Fourteen tubes involved in the ectopic on section showed salpingitis. Five tubes removed on the opposite side showed salpingitis. This shows an incidence of 18.6 verified histologically.

Serologic tests in sixty-five cases revealed latent syphilis in five patients.

Previous Abortion.—Of the eighty-nine parous women in this group twenty-four, or 27 per cent, had aborted spontaneously one or more times. The abortion rate in the hospital during the same period was 16.6 per cent. Termination of 239 pregnancies occurring in these eighty-nine women prior to this ectopic is indicated in Table IV.

The abortion rate for the hospital (16.6 per cent) is lower than that for ectopics (27 per cent). This is not significant. However, the number of fruitful pregnancies, 71.13 per cent, is approximately that of the general population, 80 per cent. Therefore, this finding in our study indicates the fault is not with the fertilized ovum but the site of implantation.

Temperature, Pulse, Blood Pressure (Admission).—Only 9 per cent of the patients had an admission temperature of 100° F. or above, the highest being 102.2° F. Eighteen per cent were admitted with subnormal temperatures, 95° to 98° F. Most of these were in shock. Pulse rate and blood pressure roughly followed the degree of shock and hemorrhage. Systolic blood pressure ranged from "not obtainable" to less than 100 in 35 per cent of the cases; 10 per cent showed a moderate hypertension and 55 per cent were normal. The pulse rate varied from 90 to 180 in 55 per cent.

Symptoms.—Pain was the predominant symptom, occurring in 97.1 per cent of the patients. Pain was absent in only three cases. The largest number complained of colicky or crampy pain, severe and intermittent in character. Sudden, severe, stabbing or lancinating pain was next in order of frequency. In one-fifth of the patients it was confined to the lower abdomen involving either one or both lower quadrants. In the others, pain was more generalized throughout the abdomen. Shoulder strap or costal margin pain was elicited in 31 per cent. Painful defecation was a complaint in fifteen per cent.

General symptoms in order of frequency were nausea and/or vomiting 41 per cent, fainting or feeling of faintness 32 per cent, weakness and dizziness 20 per cent. Other symptoms were dysuria, urgency or frequency 12.7 per cent, diarrhea 5.9 per cent. None of our patients presented the so-called "morning sickness" observed in uterine pregnancy.

Vaginal bleeding was the next most common symptom. It was present in 77 per cent of our cases. The various types of bleeding are best demonstrated in Table V.

Amenorrhea.—Seventy per cent of our patients missed one or more periods. In 6 per cent the onset of symptoms occurred when menses were due. Twenty-four patients missed no periods. Eight of these gave a history of some abnormality of the last menses, either a scantier flow or a shortened duration. Frequency of amenorrhea is shown more clearly in Table VI.

Abdominal and Pelvic Findings.—The most common sign on abdominal examination was tenderness which was elicited in seventy-nine

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TABLE V. VAGINAL BLEEDING (100 CASES)

	No. Cases	Per Cent
No bleeding	23	23
Slight Spotting Scanty	30	30
Irregular and Intermittent	15	15
Continuous	18	18
Profuse	8	8
Like normal menses or prolonged	6	6

TABLE VI. MENSES (100 CASES)

Periods Missed	No. Cases	Per Cent
0	24	24
Due	6	6
1	33	33
2	29	29
3	6	6
5	1	1
8	1	1

cases. Distention was present in thirty-six cases, rebound tenderness in thirty-seven, rigidity in twenty-four, and evidence of free fluid in sixteen. An abdominal mass was palpated in ten instances. Adnexal mass or masses was the most frequent pelvic finding, palpated in sixty-four cases. Cul de sac fullness, crepitation or mass was noted in fifty-one instances. Other pelvic findings were painful tender cervix noted thirty-six times, purplish blue cervix nineteen, soft cervix eighteen, and Chadwick's sign positive three times. Cullen's sign was not observed. The corpus was described as normal in size in three-fourths of the cases and enlarged in one-fourth.

Abdominal distention, crampy colicky pain associated with nausea and vomiting, no menstrual abnormality and a previous laparotomy scar posed the problem of bowel obstruction in the differential diagnosis in nine cases. Flat x-ray plate of the abdomen ruled it out in eight cases. In the ninth, an x-ray diagnosis of paralytic ileus was made.

Blood Findings.—The blood pictures conformed to those generally observed by others. Details will be omitted. Initial hemoglobin readings and erythrocyte counts during or shortly after severe hemorrhage presented a false picture of the extent of blood depletion. Repeat examinations in forty-eight to seventy-two hours gave the true picture. In slightly less than one-third of our patients (33) the admission hemoglobin was under 60 per cent. Leukocyte counts were increased in the presence of hemorrhage and markedly so with massive hemorrhage. In forty-one cases the count was under 10,000. Sixty-one cases had counts ranging from 10,000 to 33,000. In thirteen patients (12.7 per cent) the leukocyte count was 20,000 or above. At operation in these the abdominal cavity was found filled with blood.

Erythrocyte counts were done in forty-three cases. The range was two to three and one-half million in twenty-one and three and one-half to four and one-half million in twenty-two. A falling red count and hemoglobin reading aided materially in diagnosis in several cases under prolonged observation. Recently a routine check of hemoglobin and erythrocytes on the third and seventh postoperative days has indicated a need for transfusion and prevented discharge from the hospital of patients with fairly severe secondary anemia.

Other Laboratory Examinations.—The Friedman test was done on sixteen patients; sedimentation rate on thirty-three; and the x-ray was used twenty-one times.

There were fourteen positive and two negative Friedman tests. In the two negatives, histologic examination of the tissue removed at operation showed necrotic, non-viable, degenerated villi.

The x-ray was of value in ruling out bowel obstruction. Lipiodol injection and x-ray in one case offered no aid. A metal contraceptive device was found imbedded in the myometrium by x-ray as an accidental finding in one instance.

The rate of blood sedimentation was determined in thirty-three instances. An attempt to correlate the finding with the amount of blood found in the abdominal cavity at operation and evidence of infection is not entirely satisfactory. In general, this showed that in twelve cases where the rate was markedly accelerated, the amount of blood found ranged from 800 c.c. to

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TABLE VII. OPERATIVE PROCEDURES

Procedures other than removing pregnant tube	No. Cases
Oophorectomy	31
Resection ovarian cysts	8
Fundusectomy	2
Hysterectomy	1
Excision of other tube	8
Suspension	6
Partial resection of pregnant tube	5
Ligation bleeding point	1
Abdominal pregnancy	1
Appendectomy	7
Curettage	16

2,000 c.c. in eleven cases. In the twelfth case, salpingitis was found in the tube opposite the ectopic. In nine cases the rate was normal. Three of these were unruptured tubal pregnancies with no peritoneal insult. In five cases, the amount of blood found varied from 50 to 200 c.c. In the ninth case, several hundred cubic centimeters were found. There was no evidence of infection in any of the nine cases with normal rates. In the other twelve cases, the curves resembled those seen in chronic salpingitis. Findings were too confused to interpret properly but in general the hemorrhage was not recent.

Treatment.—These cases were cared for by eight attending staff members or under our supervision by the resident gynecologist. As would be expected there were individual variations in procedure. Immediate operation was the usual rule as soon as diagnosis was definite. Fifty-three were operated upon within one hour to less than twenty-four hours after admission. In four cases delay in operation was elected. Two ruptured under observation and went into severe shock. The outcome was favorable but their hospital stay was prolonged and they were submitted to unnecessary risk. When the diagnosis is definitely made, it is the author's opinion that expectant treatment has no place in the management of ectopic pregnancy. Removal of the affected tube only was the operation usually done. Concomitant surgery in this series is shown in

Table VII. Some of these procedures are not recommended.

Transfusion.—Autohemoclysis was not done in any of our cases. Transfusion was done before operation in four cases and during or after operation in the remainder. Forty-five of our patients received from one to several transfusions. Nineteen shock cases received forty-two transfusions and twenty-six non-shock cases received forty transfusions. The average amount was 1,400 c.c. for those in shock and 900 c.c. for those not in shock. Only three mild reactions ensued out of eighty-two transfusions administered. This is a reaction rate of 3.6 per cent. The reaction rate of the minor variety generally is estimated at from 5 to 10 per cent. In the three patients having reactions all were given single transfusions of 450 to 500 c.c. Eight patients received massive amounts of blood from 2,000 to 4,000 c.c. None of these had reactions.

From our experience the observation seems warranted that reactions due to presence of immune intragroup agglutinins and anti-Rh agglutinins recently emphasized in late pregnancy are not to be feared in early ectopic pregnancy.

Morbidity and Postoperative Complications.—Twenty patients (20 per cent) had a morbid postoperative course. The cause of pyrexia was undetermined in five. When incomplete peritoneal toilet (removal of old blood and clots only) was elected no increase in morbidity was noted. Colpopuncture four times and abdominal peritoneal aspiration once did not increase febrile reactions. This held true for preliminary curettage. Done sixteen times, curettage showed decidua in one case. The endometrial pattern in the remaining fifteen showed various phases, proliferative or secretory.

Complications alone or in combination were wound infections six, upper respiratory infection five, pneumonia two, cystitis two, pyelocystitis two, thrombophlebitis one, parotitis one and second degree burn one. Three wound infections associated with upper respiratory infection were slight; only one wound broke down.

Inhalation anesthesia was used in ninety cases. It is interesting to note that one of six cases done under spinal anesthesia had a morbid course and one of the two postoperative pneumonias occurred in one of the four patients operated upon

under local abdominal block anesthesia. This is a morbidity of 20 per cent for general anesthesia and 10 per cent for noninhalation anesthesia.

The average number of hospital days was 19.3 including pre-operative and postoperative days. Our high morbidity rate and a pre-operative hospital stay from one to three weeks in twenty-one instances accounts for the high average.

Summary and Conclusions

1. A survey of 102 ectopic pregnancies is presented. The percentage of cases admitted in shock is high (27.4 per cent).
2. Operative mortality was 1 per cent, total mortality 2.94 per cent. Prompt surgery even on moribund patients with availability of blood from the blood bank were factors in producing the low mortality.
3. Incorrect diagnoses can be materially lowered by proper interpretation of the history and evaluation of the clinical and laboratory findings.
4. A period of relative sterility from six to seventeen years occurring in 26.6 per cent of the cases seems significant.
5. A high incidence of previous lower abdominal surgery (31.3 per cent occurred. The incidence of previous pelvic infection (18.6 per cent) confirmed histologically is low.
6. Five recurrent ectopics (4.9 per cent) in this series is high. The occurrence of 6.4 per cent of intraligamentous pregnancies in the series is extremely high.
7. Fruitful pregnancies in the group prior to this ectopic approximates the general population rate. This indicates the fault is not with the ovum but site of implantation.
8. Abdominal pain was the predominant symptom. Shoulder strap or costal margin pain was

elicited in a high per cent (31 per cent) of the patients.

9. Abdominal distention in thirty-six cases is much higher than generally reported by others.

10. Routine repeat hemoglobin and erythrocyte determinations proved valuable.

11. Sedimentation rate was markedly accelerated in cases with massive hemorrhage.

12. A transfusion reaction rate of the minor variety of 3.6 per cent compared to the generally estimated rate of 5 to 10 per cent shows that ectopics tolerate transfusion well.

13. Reactions due to presence of immune intra-group agglutinins and anti-Rh agglutinins recently emphasized in late pregnancy would seem not to be feared in early ectopic pregnancy.

14. Two cases of tubal edometriosis were demonstrated histologically. Abdominal endometriosis in the upper angle of a previous operative scar was observed in one case.

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HORMONES ARE ENGINEERS

Sex hormones, or gland secretions, act as "engineers" in directing the development of unborn animals, according to Dr. Vera Danchakoff of the University of Lausanne, Switzerland.

Dr. Danchakoff worked with a considerable range of animals, including mammals, birds, fishes and amphibians. In general, she found it possible to change the direction of sexual development by injecting the hormone of the opposite sex. That is, if the developing embryo were destined to become a female (which can be told by microscopic examination of its cell chromosomes), it could be induced to develop the external sex organs of a male by sufficiently heavy doses of male sex hormone. The opposite change could be produced by female sex hormone in a genetically male embryo.—*Science News Letter*, April 11, 1942.

THE FATE OF THE MAJOR SURGICAL CASE IN THE SMALL HOSPITAL

DAVID P. ANDERSON, JR., M.D.
Austin, Minnesota

APPROXIMATELY 27 per cent of active general hospital beds in the United States are located in hospitals of 100-bed capacity or less;¹ in the state of Minnesota 39 per cent of active general hospital beds are in this group of smaller hospitals. Although a few smaller hospitals are located in the large cities or suburban districts of large cities, the majority of these hospitals serve the small cities, towns, and rural communities of the nation. An untold number of patients requiring major surgical operations are treated in these small hospitals. The fate of these patients is little known, for the surgeon in a small community is seldom able to collect a large series of cases that he is justified in reporting to the profession, and, in smaller groups, one unfortunate case will unduly distort the statistical results.

It seems that a general survey of the quantity and quality of the major surgery performed in a small hospital in a fairly representative community should be of interest to the profession in general and of particular interest to those organizations that have done so much to obtain and maintain a high standard in the practice of surgery. It seems likely, too, that the ever-increasing number of young men who are receiving special surgical training should be interested in the scope of surgery away from their centers of training. Therefore, a six-year survey of major surgical cases in a small hospital has been made in an endeavor to ascertain the type of surgery and the fate of the patients under such conditions.

This survey includes all major general surgical operations performed by members of the Austin Clinic in the St. Olaf Hospital, Austin, Minnesota, for the six-year period ending March 1, 1942. These cases represent a majority of the major surgery performed in this hospital. Major otolaryngological surgery and ophthalmological surgery have not been included in this survey. In the cases reported operations were performed by one of four men: three general surgeons, all of whom have now been qualified by the American Board of Surgery, and one general practitioner who has limited his work to emergency cases. It should be noted that the St. Olaf Hospital has been enlarged and now exceeds the 100-bed capacity limit established for this survey. This hospital serves the city of Austin, which has a pop-

ulation of approximately 21,000, and smaller towns and rural districts within a radius of thirty-five miles.

A general survey of the 785 major surgical procedures included in this report is given in Table I. An attempt has been made to include only major cases, although the differentiation between "major" and "minor" cases is difficult at times. Thoracotomy and drainage for empyema thoracis has been considered as a major procedure, for example, although the actual operation may be less different technically than a high saphenous ligation, a procedure which is distinctly "minor" in character. Multiple-stage operations have been listed only once in this table, and combined operations, such as cholecystectomy and appendectomy, have been listed only under the title of the primary procedure.

The hospital mortality in this series of 785 cases was 3.9 per cent. A "corrected mortality" of approximately 3 per cent may be obtained by eliminating those deaths which occurred one month or longer after operation and which were not directly due to the operation. This is a reasonably satisfactory record. Nevertheless, there were a number of avoidable deaths in this series (Table II). These were due largely to errors in judgment or errors in diagnosis, although there was one death due to anesthesia.

A consideration of some of the various operations and specific surgical diseases covered by this survey is of interest. The most common disease requiring surgical treatment is appendicitis. In this series, 333 appendectomies for non-perforative appendicitis were performed without a death. The surgical mortality in thirty-five cases of perforative appendicitis was 8.6 per cent. There have been no deaths in the last twenty-two operative cases of perforative appendicitis, although one patient who had an incision and drainage of a localized purulent collection in the left lower quadrant died of generalized peritonitis which may have been appendiceal in origin. Two other patients, who were admitted in the advanced stages of peritonitis, were treated conservatively as probable cases of perforative appendicitis; autopsy in one patient revealed the presence of acute hemorrhagic pancreatitis.

MAJOR SURGICAL CASE IN SMALL HOSPITAL—ANDERSON

TABLE I. SURVEY OF OPERATIVE PROCEDURES

Type of Operative Procedure	Total Cases	Hospital Deaths	Type of Operative Procedure	Total Cases	Hospital Deaths
Craniotomy (extradural hematoma—depressed skull fractures)	3	0	Incision and drainage, perforative appendicitis	7	2
Thyroidectomy	15	1	Cecostomy for acute obstruction, large bowel	5	3
Cervico-thoracic ganglionectomy	1	0	Colostomy, palliative	6	1
Radical excision, carcinoma of the sub-maxillary gland	1	0	Colon resections (ileocelectomy, combined recto-sigmoid resections, etc.)	9	2
Tracheotomy	2	1	Sigmoidotomy, benign polyps	3	0
Thoracotomy and drainage for empyema	6	1	Closure of fecal fistula	2	0
Resection, chondrosarcoma of ribs and pleura	1	0	Suprapubic cystostomy and prostatectomy	4	2
1st stage drainage, subdiaphragmatic abscess	1	1	Radical penectomy for carcinoma	1	0
Diagnostic abdominal exploration	9	1	Nephrectomy for hypernephroma	1	0
Subtotal gastric resection	3	1	Pelvic plastic and uretero-nephrostomy for non-calculus hydronephrosis	1	0
Gastro-enterostomy	3	0	Myomectomy	1	0
Closure, perforated peptic ulcer	9	1	Hysterectomy	43	1
Splenectomy	3	1	Vaginal plastic-suspension operations, etc.	38	0
Pancreatico-duodenectomy, 1st stage, for carcinoma of the ampulla Vater	1	1	Ectopic pregnancy, salpingectomy	5	0
Cholecystostomy	6	1	Salpingo-oophorectomy, elective	11	0
Cholecystectomy	48	1	Abdominal hysterotomy and sterilization	2	0
Cholecystostomy and choledochostomy	3	1	Ovarian cystectomy	17	0
Cholecystectomy and choledochostomy	5	0	Cesarean section	4	0
Acute obstruction, small intestine:			Elective herniorrhaphy	67	0
Due to postoperative adhesions	9	0	Femoral (8)		
Due to strangulated hernia	14	2	Inguinal (50)		
Due to intussusception	5	0	Umbilical (3)		
Due to gallstone ileus	1	0	Incisional (6)		
Small bowel resections, non-obstructed	2	0	Breast amputations for carcinoma	10	0
Ileostomy, for partial obstruction	1	1	Open reductions, major fractures	9	0
Incision and drainage, intra-abdominal abscess (non-appendiceal)	3	1	Internal fixation, intracapsular fractures of the femur	10	1
Elective appendectomy, recurrent appendicitis	48	0	Sequestrectomy and drainage, osteomyelitis	7	0
Acute non-perforative appendicitis, appendectomy	285	0	Amputations, major	5	2
Appendectomy and drainage, perforative appendicitis	28	1	Resection of scapula, partial, for osteochondroma	1	0

There were two deaths in twenty-nine cases of acute obstruction of the small bowel, a mortality of 6.9 per cent. The mortality in sixty-two operations on the gallbladder and biliary tract was 4.8 per cent; in forty-three total and subtotal hysterectomies, there was one death from pulmonary embolism, a mortality rate of 2.3 per cent.

There have been twenty-two major surgical procedures in the past two and a half years for the radical cure of cancer. These procedures include gastric and colon resections, radical mastectomies, total hysterectomies for carcinoma of the fundus uteri, a nephrectomy for hypernephroma and other types of major surgery. The mortality in this group was 13.6 per cent. The mortality was approximately 27 per cent in eighteen major procedures for the diagnostic and palliative treatment of malignancy. There was

one opportunity to perform a resection of the duodenum, common duct and head of the pancreas for carcinoma of the duodenum at the ampulla of Vater. There have been only sixty-four operations of this type reported to date.² This patient died of chronic nephritis and uremia on the nineteenth postoperative day. An autopsy revealed no technical errors in the operative procedure, but the presence of early liver metastasis had not been detected clinically.

Attention is called to the fact that a few of the operative procedures in this series are not strictly within the scope of general surgery. The surgeon in a small community is occasionally called upon to perform an emergency operation, such as a cranial decompression, that he would otherwise gladly refer to a surgeon specifically qualified in one of the special fields of surgery.

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TABLE II

Patient Sex-Age	Operative Diagnosis	Operation	Primary Cause of Death	Interval	Patient Sex-Age	Operative Diagnosis	Operation	Primary Cause of Death	Interval
J.C. WM 84	Gangrene of the gall bladder with perforation—common duct calculus	Cholecystostomy and choledochostomy	Broncho-pneumonia	9 days	E.U. WM 51	Carcinoma of larynx	Tracheotomy	Carcinoma with metastasis	7 days
M.A. WF 56	Chronic cholecystitis. Acute pancreatitis	Cholecystectomy	Acute pancreatitis	13 days	A.H. WM 69	Carcinoma of the stomach	Gastric resection	Aspiration pneumonia	1 month
G.E. WM 59	Gangrenous cholecystitis	Cholecystostomy	Broncho-pneumonia	10 days	E.O. WM 40	Acute perforated duodenal ulcer	Closure of perforation	Peritonitis	6 days
E.S. WM 48	Acute appendicitis with perforation	Incision and drainage	Peritonitis	11 days	O.O. WM 77	Empyema thoracis	Closed drainage	Coronary occlusion	2½ months
E.Y. WM 29	Acute appendicitis with perforation	Appendectomy and drainage	Peritonitis	3 days	H.A. WM 67	Chronic sub-diaphragmatic abscess	Drainage	Coronary occlusion	7 days
G.B. WF 17	Acute appendicitis with perforation	Incision and drainage	Peritonitis	8 days	J.J. WF 86	Intracapsular fracture of femur	Internal fixation with Moore pins	Broncho-pneumonia	5 days
A.K. WF	Peritonitis, cause undetermined—possible appendicitis	Incision and drainage of abscess	Peritonitis	7 days	O.A. WM 30	Traumatic leg amputation	Amputation	Shock	4 hours
T.L. WM 76	Volvulus of cecum with gangrene	Cecostomy	Uremia—Peritonitis	4 days	S.D. WF 66	Arteriosclerotic gangrene of leg	Amputation	Not recorded	2 months
G.B. WM 67	Acute obstruction, large bowel, due to carcinoma	Cecostomy	Peritonitis	5 days	G.L. WF 58	Traumatic rupture of spleen	Splenectomy	Shock	in OR
W.A. WF 59	Carcinoma of the cervix with secondary carcinoma of the sigmoid—obstruction	Colostomy	Carcinoma, general metastasis	6 weeks	L.J. WF 39	Fibromyoma uteri	Hysterectomy	Pulmonary embolism	9 days
T.C. WM 82	Carcinoma of the sigmoid with peritoneal metastasis	Ileostomy	Peritoneal carcinomatosis	1 month	R.K. WM 64	Carcinoma of the duodenum at the ampulla Vater	Pancreatico-duodenectomy, 1st stage	Uremia	19 days
C.P. WF 76	Carcinoma of the right colon	Ileocelectomy, 1st stage	Broncho-pneumonia and peritonitis	5 days	W.S. WM 61	Carcinoma of the prostate, recurrent, with hemorrhage	Cystostomy	Carcinoma, general metastasis	6 months
S.F. WF 64	Volvulus of the cecum with gangrene	Ileocelectomy, 2nd stage	B. Welchii septicemia	12 days (after 2nd stage)	B.B. WM 77	Carcinoma of the bladder with hemorrhage	Cystostomy	Coronary occlusion	3 days
T.S. WF 65	Carcinoma of the ovary with peritoneal metastasis	Exploration	Carcinomatosis	17 days	H.H. WM 53	Hyperthyroidism	Thyroidectomy	Operative shock	20 min.
					E.McF WF 86	Carcinoma of ovary with abdominal carcinomatosis and obstruction	Cecostomy	Carcinomatosis	11 days
					A.B. WF 84	Strangulated femoral hernia	Resection of gangrenous bowel	Strangulated hernia	1 day
					B.E. WF 45	Incarcerated incisional hernia	None	Spinal anesthesia	in OR

In elective cases, those patients who required orthopedic or neuro-surgical operations, extensive or delicate plastic procedures, transurethral resection, and similar special treatment beyond the scope of the general surgeon, were referred to nearby medical centers.

Summary

A survey has been made of the major surgical cases treated by members of the Austin Clinic in the St. Olaf Hospital in Austin over a six-year period. This survey has been presented in order to give a general idea of the scope of surgery in a small community.

The trend of medical education in the past few years has been toward the elimination of the self-trained and often self-named surgeon. Post-graduate teaching courses and surgical residencies

have been increased in order to afford adequate surgical training to a larger group of medical graduates. It is logical to assume, however, that the standard of surgery throughout the nation will not be proportionately increased unless a fair number of well-trained general surgeons elect to practice in smaller communities. This report is offered as a basis for an estimation of the quantity and quality of major surgery which is encountered in a smaller community.

The author wishes to express his appreciation to Dr. U. Schuyler Anderson, of Minneapolis, Minnesota, and Dr. Francis E. Kibler, of Colorado Springs, Colorado, for permission to report their cases and for their kind cooperation.

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ANESTHESIA IN THE SMALL HOSPITAL

HARRY B. NEEL, M.D.

Albert Lea, Minnesota

THE selection of the anesthetic agent to be employed in an operative procedure is the responsibility and privilege of the surgeon. In deciding on the anesthesia of choice he may be advised by the anesthetist, and he may be cognizant of the wishes of the patient, but with his knowledge of the physical condition of the patient, gained from a carefully taken history and a physical examination thoroughly performed, and with the requirements of the proposed surgery in mind, the surgeon should be able to select the most suitable form of anesthesia from several at his command.

The surgeon who leaves this decision to the anesthetist alone, or who accepts the anesthesia which is given most conveniently, or who is thinking entirely of saving time, is placing himself at a disadvantage before the actual operation begins, and may be causing great deprivations to his patient. The operator who is accustomed to but one method of anesthesia is not accepting the opportunities which medical progress has made possible.

The recognition of the importance of anesthesia is manifested by the growth of the specialty of anesthesiology and by the establishment of departments of anesthesia in the large medical centers. In some measure this specialty of anesthesiology is the product of convenience and interest, as are other specialties, and does not indicate that the small institution without physician-anesthetist cannot offer good and proper anesthesia. It has been stated recently that all anesthetics should be administered by physician-anesthetists. This has been disconcerting to the small institution where physicians who devote their full time to anesthesia are not available. The experience of many, including ourselves, is that properly trained nurse-anesthetists are absolutely reliable and can administer inhalation anesthesia entirely satisfactorily. The employment of nurse-anesthetists in all cases is much preferable to the use of a physician who has had little experience and infrequent practice in the administration of anesthesia.

TABLE I. SURGICAL PROCEDURES IN WHICH
NITROUS OXIDE-OXYGEN-ETHER COMBINATION
WAS EMPLOYED AS THE ANESTHETIC
AGENT

	No. cases
Surgery of the gall bladder and bile ducts.....	23
Appendectomy	39
Abdominal pelvic operations.....	28
Operations on the colon.....	1
Operations on stomach and duodenum.....	7
Kidney operations.....	2
Cesarean section.....	3
Operations on the breast.....	5
Miscellaneous	9
	117

An analysis of our cases at the Næve Hospital during the past eighteen months has been of considerable interest. Of 254 patients submitted to operation, 117 (46 per cent) have received inhalation anesthesia, usually nitrous oxide, oxygen, and ether. So skillfully has the anesthetic been administered by our nurse-anesthetists* that in not one instance have we been concerned about the anesthetic during the course of the operation, and there have been no deaths attributable to the anesthetic. There have been few complications in any way related to the anesthetic and only one case of atelectasis. In this instance the mucous plug was removed through the bronchoscope and the patient made a prompt and complete recovery.

Although we have been prepared to insert an intratracheal tube if necessary, the need for this has not arisen. It is possible that we are overlooking some of the advantages of the intratracheal tube but when the airway is adequate and relaxation satisfactory we have seen no reason to place a tube in the trachea. The necessity of an intratracheal tube in certain conditions is incontestable and the availability of a tube and a laryngoscope may occasionally save a life. Every operating room should possess facilities for inserting an intratracheal tube.

For major surgery inhalation anesthesia is still probably the safest in the majority of cases. One reason for this is that this method is the oldest and is the best understood by physicians and

Presented at the meeting of the staff, Næve Hospital, Albert Lea, Minnesota, April 13, 1942.

*Miss Mary King and Miss Mabel Peterson.

anesthetists. There are contradictions to inhalation anesthesia, however, and there are desirable features of anesthesia which an inhalation agent does not afford. In such instances one must employ another method of producing anesthesia.

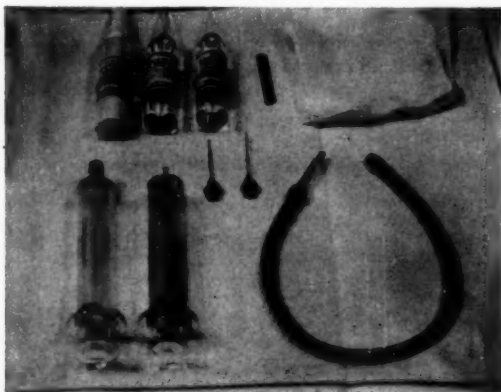


Fig. 1. Equipment used for preparation and administration of intravenous anesthesia: (1) One ampule of pentothal sodium; (2) two 20 c.c. ampules of sterile distilled water; (3) file; (4) sponges; (5) two needles No. 20 gauge; (6) two 20 c.c. syringes. The rubber tubing is necessary only when the Rudder syringe holder is used.

Intravenous Anesthesia

Pentothal sodium has been administered intravenously in 2.5 per cent solution seventy-four times, excluding uses of this agent outside of the operating room. We find that we are using this form of anesthesia more and more frequently and for operative procedures of longer duration. The use of pentothal sodium has received such wide publicity that there is little that we can add from our experience except to point out that it is a splendid agent for use in the small hospital. The growing popularity of this anesthetic in our hospital is in keeping with the trend in larger institutions.

TABLE II. SURGICAL PROCEDURES IN WHICH PENTOTHAL SODIUM WAS EMPLOYED

	No. cases
Gynecological	19
Induction or supplement to other agents.....	8
Draining abscesses.....	7
Removal of breast tumors.....	5
Reduction fractures and dislocations.....	15
Miscellaneous	20
	<hr/> 74

Very little equipment is necessary for the preparation and administration of this drug. The equipment which we use has been reduced to a

minimum and is shown in Figure 1. A 5 per cent solution is obtained by drawing 20 c.c. of distilled water into a syringe and adding it to the vial containing one gram of pentothal sodium. The solution is thoroughly mixed and 10 c.c. is



Fig. 2. Pentothal sodium anesthesia administered with the Rudder syringe holder and the BLB mask.

drawn into each of two syringes. Into each of these syringes is then drawn an additional 10 c.c. of distilled water. The plunger of the syringe is drawn back farther than is necessary and the syringe then shaken vigorously. Each syringe now contains 20 c.c. of a 2.5 per cent solution of Pentothal Sodium which is ready for administration.

It is important to perform a "clean" venipuncture. Extravasation of the solution into the tissues, although usually not serious, may cause the patient unnecessary pain and delay the induction. About 5 c.c. of the solution is then injected slowly while the patient counts, and this amount is usually sufficient to produce unconsciousness. The depth of respiration is carefully observed. To maintain the proper depth of anesthesia, the anesthetic solution is injected intermittently in small amounts as indicated. It is felt that the administration of an intravenous anesthetic, if carefully and skillfully performed, is as much under control as is the administration of inhalation anesthesia.

Recently we have used pentothal sodium in combination with oxygen very satisfactorily for major abdominal surgery. The Rudder syringe holder is employed and the anesthetist is able to administer the anesthetic and to watch the condition of the patient just as carefully as in inhalation anesthetics. Following the suggestion of Dr.

ANESTHESIA IN THE SMALL HOSPITAL—NEEL

TABLE III. SURGICAL PROCEDURES IN WHICH SPINAL ANESTHESIA WAS EMPLOYED

	No. Cases
Appendectomy.....	21
Herniorraphy.....	12
Vaginal hysterectomy.....	7
Vaginal repair.....	6
Operations on the colon.....	3
Closure perforated duodenal ulcer.....	1
Anorectal procedures.....	8
Cesarean section.....	2
Miscellaneous.....	3
	63

C. H. Watt, of Thomasville, Georgia, a small quantity of procaine hydrochloride has been injected in the skin before making the incision. Relaxation has been excellent, and the patients have benefited by the absence of nausea and vomiting. Dr. Watt is of the opinion that this pentothal sodium-oxygen combination allows a more rapid recovery and shortens postoperative hospitalization.

Spinal Anesthesia

As stated by Blalock, the most important factors which govern the choice of an anesthetic agent are the safety of the patient and the effectiveness of the anesthesia for the operation proposed. It has been said that no anesthetic facilitates the work of the surgeon more nicely, and yet is more hazardous to the patient, than spinal anesthesia. Graham and Brown are of the opinion that a surgeon is guilty of malpractice if he operates on a patient with intestinal obstruction under inhalation anesthesia if adequate facilities for spinal anesthesia are available, and Masson has said that he would employ spinal anesthesia more frequently if he did not have a good anesthetist. There is a growing enthusiasm for spinal anesthesia which is occasionally dampened by reports of serious complications, and even fatalities. The dangers associated with the employment of a spinal anesthetic should not be minimized and the actual administration of the anesthetic should be undertaken only by competent persons.

It is desirable to restrict the use of spinal anesthesia to operations below the diaphragm and the danger is decreased if it is still further limited to operations below the umbilicus. In patients with emphysema, bronchiectasis, active pulmonary tuberculosis, asthma, chronic bronchitis

TABLE IV. DOSAGE AND DILUTION OF METYCAINE IN SPINAL ANESTHESIA†

Operation	Injection between lumbar vertebra	Metycaine dose (Mgm.)	Total volume anesthetic solution and spinal fluid (c.c.)*
Appendectomy	2 and 3	100—150	3
Herniorraphy	2 and 3	100—150	2.5-3
Vaginal hysterectomy	2 and 3	110—150	3
Perineal repair	3 and 4	100	2
Anorectal surgery	3 and 4	50— 75	1.5

†Modified from Stein and Tovell.

*Rate of injection not greater than 0.5 c.c. per second.

and acute upper respiratory infections spinal anesthesia is particularly useful. In diabetic patients it is important to interfere as little as possible with the dietary regime, and spinal anesthesia affords a quick recovery. Finally, spinal anesthesia is useful in operative procedures which require complete relaxation, and in the repair of hernias, removal of large pelvic tumors, surgery of the colon, and amputation of a lower extremity.

As a general rule it has been our custom to reserve the use of spinal anesthesia for surgery of the lower abdomen, perineum, and lower extremities. In the occasional case, if conditions demand, spinal anesthesia is employed for operations on the upper abdomen. It is my impression that in producing spinal anesthesia complete familiarity with one anesthetic agent, gained by continual use of that agent, is preferable to the occasional use of one of several drugs. I have used metycaine exclusively and with complete satisfaction. The dose is somewhat smaller than that of procaine and never exceeds one milligram per pound of body weight. The largest dose which we found necessary was 175 mgm. The amounts which we customarily use, and the dilutions necessary, are tabulated according to operations in Table IV.

An attempt has been made to simplify the administration of a spinal anesthetic and the equipment necessary is shown in the illustration. The use of a punch and a guide for the needle seems unnecessary to me, and only traumatizes the tissues, resulting in severe backache in many cases.

A spinal puncture needle of small calibre (No. 21 gauge) is used routinely and in no case has it been impossible to obtain spinal fluid and to inject the anesthetic. Ephedrine sulphate, 25 to 50 mgm., is given subcutaneously in each case

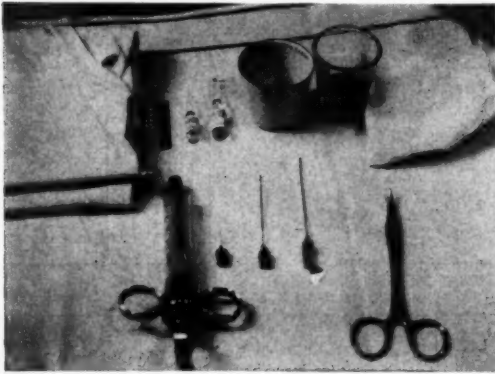


Fig. 3. Tray for spinal anesthesia: (1) Drape sheet; (2) file; (3) ampule ephedrine sulphate 50 mgm.; (4) ampule metylocaine hydrochloride, 2 c.c., 10 per cent solution; (5) solution procaine hydrochloride 1 per cent; (6) tincture of iodine; (7) sponges; (8) Luer-lok syringe; (9) three needles—hypodermic, 2 inch, No. 21 gauge spinal puncture needle; (10) hemostat.

and in only one instance was the fall in blood pressure sufficient to necessitate another injection of the drug.

In our small group of cases we have used spinal anesthesia sixty-three times. In sixty-one patients the anesthesia produced was entirely satisfactory. In one case insufficient anesthesia was obtained and it was necessary to perform the operation under local procaine infiltration anesthesia supplemented with pentothal sodium given intravenously. In another case the anesthesia produced was only partial. There was one case in which the patient complained of backache and one case in which headache followed the anesthetic. Both of these complaints were no longer existent when the patients were dismissed from the hospital.

Although we have used sacral block anesthesia for anorectal surgery, we have come to rely on spinal anesthesia for surgery in this field. Sacral block anesthesia is unquestionably excellent but

it is sometimes difficult to administer and we feel that the seven punctures necessary are more painful to the patient than the one required for spinal anesthesia. We continue to employ sacral block anesthesia frequently enough to keep familiar with the technique, and in those patients who object to spinal injections. For ano-rectal operations we have found small doses of metylocaine injected in the third lumbar interspace, and in weak dilutions, to give perfect anesthesia.

Conclusion

It is imperative that we give adequate attention to, rather than minimize, the importance of anesthesia. The administration of the anesthetic should be considered an integral part of the surgical procedure, the success of the latter depending to a great degree on the choice of the anesthetic agent and the skill with which it is administered. Although the great advances in the art of anesthesia will probably be made by the anesthetists, the surgeon should be aware of the progress that is being made and he should be able to administer the special forms of anesthesia. In the small hospital, general inhalation, intravenous, local, spinal and sacral block anesthesia should be available, and facilities for insertion of an intratracheal tube are highly desirable.

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PLANT HORMONE STIMULATES

A hitherto unidentified sex hormone produced by plants, strongly stimulating sexual maturation in female animals, has been reported by Dr. Eliseo T. Gomez, U. S. Department of Agriculture physiologist. Extracts from freshly cut or frozen young oat and corn plants, Dr. Gomez found, would produce evidence of sexual maturity when fed to female rats only three weeks old, which did not appear in untreated "control" animals until they were a good eight days older. Puppies showed similar signs of precocious maturity when they were nursed by mothers (or foster mothers) receiving the plant extracts in their diets. —*Science News Letter*, April 11, 1942.

RURAL NURSING PROBLEMS

LOUISE NEWCOMBE

Duluth, Minnesota

THE problems of rural and urban nursing are not very different. In each it is of most importance to see that the patient receives the best care possible, and this calls for nurses not only for bedside nursing, but for specialized departments, as Operating Rooms, Obstetrics, Pediatrics and for supervision and teaching, if there is a nursing school. Sometimes the care of the patient and the teaching of the student seem to conflict somewhat, and it is a problem to see that each gets its fair share. There is also, and always, the problem of keeping expenses within the budget, as nursing schools, unlike other schools and colleges, receive no aid from the government or the public. I wish to qualify that by saying that just recently Federal aid has been made available for certain schools.

For some time we have been hearing of a graduate nurse shortage and sometimes the Board of Nurses Examiners is accused of having closed the smaller schools. As a matter of fact, the schools closed by our Board have been very, very few. It is true that at one time, about eighteen to twenty years ago, we had sixty-three accredited schools in Minnesota, and now only twenty-nine, but the economic situation entered into this picture. During the last war we had a serious nurse shortage; hospitals were urged to increase their student enrollment, and did so; and then you will remember that along about 1929, ten to twelve years ago, there appeared more or less suddenly to be a great surplus of graduate nurses and too many students in the schools. This was of course coincident with the general depression and, while nurses were not the only group that suffered, nevertheless in some of the eastern cities nurses were in the bread lines, and considerable attention was drawn to the matter. It was discovered also that nurses who had received a broader basic nursing education fared better, because more fields were open to them, while those whose nursing education had been limited found it difficult to get employment.

All hospitals were urged to curtail enrollment and employ their own graduates, and nurses could

be had for as little as \$20, \$25, \$40 per month and even for maintenance only, in some cases. So it was only natural and logical that many smaller hospitals closed their schools, because it was cheaper and easier to staff their hospitals with their graduates. Patients and doctors liked the graduate service and the graduates liked the regular hours and steady work. This is really why we have fewer schools in Minnesota, and I wish to emphasize that this was by no means confined to Minnesota, but was general in the United States.

Then once again the economic pendulum swung and we emerged from the depression; work became plentiful; salaries and wages started going up; hours of work were shortened, and we began to hear of difficulty in getting graduate nurses; and this again was nationwide and was not limited to the nursing profession alone.

It always takes time to realize a "trend" and also more time to decide what to do about it. Hospitals were afraid, for various reasons, to increase their student body too rapidly and found difficulty in meeting the rising costs.

Nurses had learned much during the depression too. No longer were they willing to work long hours, and the eight-hour day came into effect, even for private duty nurses. They wanted higher wages too and got them, but slowly. Student applicants also wanted to be very sure they were going to receive an adequate nursing education which would fit them to hold their own in the economic world. In short, they were all looking for their share in the more abundant life we were hearing considerable about at that time.

Hospital ward aides came into use about that time, but more of them later.

Student enrollment has increased steadily. From January 1, 1937, to January 1, 1942, there was an increase of 22 per cent in Minnesota. Graduate registration has risen also. From January 1, 1937, to January 1, 1942, the increase was 47.3 per cent in Minnesota. Why then are we short today? For the following reasons:

1. Public Health Nursing (Jan. 1937 = 19,939; Jan. 1, 1941 = 23,705 — nearly 4,000 more).

Read before the meeting on Interprofessional Relations held at St. Cloud, Minnesota, April 23, 1942.

2. Industrial Nursing (Jan. 1937 = 2,203; Jan. 1, 1941 = 3,092—nearly 1,000 more). I am sure this number has increased since then due to our defense industries.

3. Airlines and passenger trains—stewardesses, new field attractive, short hours, good pay, travel, meeting people, et cetera.

4. Hospitals put in an eight-hour day and six-day week, in line with other branches of industry, and this has taken a good many more.

5. Marriages increased with improved economic conditions. Some married nurses work, but others do not.

6. Lastly, the war, Red Cross and federal services claim many. There are no definite figures available as this is a military secret but there were approximately 11,000 on duty sometime ago.

Figures from Red Cross for the United States:

1. Transfers from First Reserve (go anywhere) to Second Reserve (active, available, but not for military duty, which means not available for armed forces) from December 4, 1941, through January and February, 1942, due to marriage were 863, an average of 288, almost 300 per month.

2. Transfers as above, for the same period for all reasons were 1,773, an average of 591 per month (almost 600).

3. Transfers from First to Second Reserve for twenty-nine months prior to Pearl Harbor were 400 per month.

Demand for nurses has increased tremendously since the United States entered the war. Our men have been sent to the four corners of the world and of course our doctors and nurses follow our fighting men. Six nurses per 1,000 men are required in the Army and three nurses per 1,000 men in the Navy; and seven doctors per 1,000 men in the Army and six doctors per 1,000 men in the Navy; and 1.5 dentists for both. The National Defense Council meeting in Chicago recently said 55,000 new student nurses must be recruited this year and 65,000 next year. As our usual national admissions equal about 35,000, we need about 20,000 more this year. The Army Nurse Corps needs 10,000 more nurses before July 1. The Army Nurse Corps needs 31,000 nurses to be on duty by the beginning of next fiscal year, July, 1942.

To blame anyone for the shortage, in view of all the above, would of course be unfair. It is just one of those economic cycles or situations which we all have to face, and face together, and try to find a solution for. Fortunately, in Minnesota, the medical, hospital and nursing groups

have always had good working relationships, and I have no doubt at all, that working together, we will find a way out.

What to Do

1. Increase student enrollment in existing schools. This is being done, as I have told you. Federal funds have recently been made available for schools now in operation, which can meet the government requirements and wish to do so, for the one purpose of increasing the number of nurses. Our national government stresses the fact that standards *not* be lowered.

2. Refresher Courses to older, inactive nurses. This is being done in many places, and with good success, and these nurses promise to be available to help when needed.

3. Possibly reopen schools now closed, if the hospitals desire.

4. Ward aides used for non-nursing duties and also the American Red Cross Volunteer Nurses Aides and WPA and NYA Auxiliary Hospital Workers.

Procedure If Hospital Wishes to Reopen Closed School

1. Should have such facilities and nursing program as will prepare their graduates to meet requirements for state registration, as well as the requirements of the Red Cross Nursing Service, since nurses enter the Army and Navy Nursing Services through the avenue of the Red Cross.

Previously the Red Cross had under consideration requiring daily patient averages of fifteen surgical, fifteen medical, ten obstetric in segregated service, eight to ten pediatric segregated service, and deficiencies made up by affiliation. The Red Cross will now accept for the duration of this emergency a daily minimum average of fifty, with deficiencies made up by affiliation.

The Red Cross requirements explain in brief many of the requirements of the Nurses State Board of Examiners. It must also be remembered that graduate nurses wish to be eligible to work in any state, if they choose. California requires that all nurses graduating since January, 1941, have had a minimum of six weeks in contagion or tuberculosis training. This is very difficult to meet, but they will accept venereal nursing as a small part.

Minnesota's educational requirement is only two years of high school by law, but the schools themselves have for years required high school graduation. Only one school requires two years of college. Our Board does not, and could not, require more than our law permits. Most states

do require high school and therefore our nurses need to have had full high school to be able to take advanced work or postgraduate courses, as well as to be able to register in other states.

Affiliation is required when clinical service is inadequate. Our Board has always recommended that the students should return to the home school after affiliation for at least the last six months, and as much longer as possible. Schools have always appeared to fear that their students would not be satisfied when they came back. Hospitals in rural districts often complain that their nurses do not wish to stay in the country after being in the city on affiliation. Well, isn't it natural they should seek the social and cultural advantages of the city just as other workers do? After all, young nurses are just like other young women, and where does "girl meet boy?" Someone once said young nurses were "mobile maidens meditating matrimony."

Our Board is the logical accrediting agency—there is no other—and, when the state places on us the responsibility to determine whether a graduate nurse is eligible for registration, it goes without saying that we have to know considerable about the hospital school from which she came. Just as in the case of accrediting hospitals for the teaching of interns, many requirements must be met.

Our Board very earnestly and sincerely wishes to be of help to all schools now operating and also to those hospitals which may wish to open schools. However, we are handicapped in this, as our law does not permit traveling expenses to any Board member for visiting schools, and at present we have no Educational Director. So, if hospitals wish our advice, it would be necessary that they pay our traveling expenses, and we would give our own time to it for the present.

When a school wishes to open, our procedure is to ask for an annual report for the previous year, showing daily averages in the clinical services, also the qualifications of the nursing staff who will be doing the teaching of the students.

At present, we are studying the clinical services in all our schools, trying to discover untapped resources which might be used for affiliations for smaller schools or for other schools which may wish to enrich their own course. For the past two years, we have been studying the adequacy

of clinical services in our existing schools, to determine if affiliation is necessary.

When a school wishes to open, they should send us in writing an outline of what they propose to do. Of course, they can make no promise to prospective students that the school will certainly be accredited, but it must be in operation as a going concern for not less than six months, as paper plans do not always materialize as expected by those who make them.

There is one more point I wish to mention—that of ward aides, nurses aides or subsidiary workers (now we are being asked to say auxiliary workers). Some people fear this group and are afraid they will get out of hand and prove a menace. I see their point of view, but I do not share it. However, I do feel these workers should be chosen carefully; have their duties clearly assigned; work under the supervision of the head nurse to whose floor they are assigned for duty, and be kept in their proper place. They should be trained for specific duties—not educated. They should be well treated and made to feel they have a place in the organization, but definitely not as nurses. The better ones may wish later to enter the nursing school, when they have earned the money, and they should be encouraged to do so, and chosen with that in mind. Up to now, their duties have been non-nursing, but there is no reason why they cannot be shown how to give, in certain types of cases, as good a bed bath as a student nurse. After all, members of a family often do. And we may have to change our conception of what constitutes non-nursing duties. There is no need ever to make a mistake in choosing for the nursing school one of these workers who has spent six months as a ward aide. Every ward aide taken into school has made good, in my experience.

"Essentials of a Good Hospital Nursing Service" and "Essentials of a Good Nursing School," have been recently revised, by a committee working under Dr. Faxon and composed of representatives of the American Medical Association, American College of Surgeons, American Hospital Association, American Nurses Association, National League of Nursing Education and Public Health Association. These are invaluable to those responsible for the good care of patients and good teaching of students, and it speaks well that all the above groups united in the re-

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vision of them, as they did in the original preparation.

In conclusion, though our problems seem difficult, they are part of the cycle or situation in

which we live at present. I am confident we will find our way out by all working together. We need your coöperation. We wish to give you ours.

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MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

Presentation of a Case

DR. S. BLACKMORE: The case is that of a fourteen-year-old negro male who was first seen at the hospital at the age of four years. He was admitted at that time with the history of pain and swelling in the right thigh and lower legs for four days before admission. He had also been dyspneic for four days. Physical examination revealed a child with a distended abdomen. There was a systolic murmur at the apex of the heart. There was definite swelling in the right thigh with pain on motion. There was pain on motion of the extremities or contact. A diagnosis of peri-osteitis, either tuberculous or syphilitic in nature, or osteomyelitis was made. He was studied in the hospital for thirty days, during which time spinal tap, x-rays and Mantoux were done. These were essentially negative. The diagnosis on discharge was undetermined.

His present admission was on July 14, 1942, when he came in with complaints of back pain and abdominal pains. The pains had started on July 10 and had come on suddenly, accompanied by malaise and fever. He also had two or three bouts of vomiting. On the following morning, he went to a private physician, who gave him an enema and sent him home. On July 12, the patient was perfectly well, felt fine, and went fishing. On the next day, however, he again had an attack of abdominal pain and a generalized feeling of illness. He was brought to the hospital approximately four days after the onset of his illness. He had previously had several attacks of this nature. The mother stated that prior to each attack she had noticed a slight icteric tinge in the sclerae.

Physical examination revealed a poorly nourished negro youth of fourteen years, who was in no acute distress. He complained of vague joint pains and generalized abdominal tenderness, apparently more severe in the lower quadrant. There were palpable submaxillary lymph nodes on both sides which felt shotty, but were not tender. Examination of the eyes revealed an icteric tinge to the sclerae. The chest was negative except for enlargement of the heart to the left. A harsh systolic murmur was heard over the entire precordium and transmitted to the axilla. The temperature was 101 degrees and pulse 120 per minute. The patient weighed

but 58 pounds. He evidently had not been eating very well, and was dehydrated. Examination of the abdomen revealed bulging, but no evidence of ascites. There was tenderness to deep palpation. The extremities were normal.

Laboratory data: The Wassermann test for syphilis was negative. The hemoglobin was 42 per cent, erythrocyte count 2,000,000, leukocyte count 11,400, with 73 per cent neutrophils, 7 per cent lymphocytes and 10 per cent monocytes. The urine was negative. There was no urobilin or urobilinogen in the urine. The hemacrit was 25 per cent. A quantitative urobilinogen was 7.7 mg. on a twenty-four-hour specimen. A blood culture was negative. The icterus index was 14, and the van den Bergh showed a slight trace to the direct reaction. A fragility test was run with the control beginning at .40 per cent sodium chloride and completed at .30. The patient's red cells began to show hemolysis at .38 and completed at .13. Blood morphology studies from a sternal biopsy revealed marked anisocytosis, poikilocytosis and polychromasia. There were occasional normoblasts showing sickle shaped red cells.

DR. GRATZKE: Here is a radiograph of the chest. He has an enlarged heart of the left ventricular type. There is nothing definitely characteristic in the radiographs of the skull. We took plates of the bones of his hands and we see here that there is loss of cortical bone. The cortex is a good deal thinner. The phalanges, as well as the ends of the long bones of the forearm, show the picture of chronic hemolytic anemia.

DR. FRANK ANDRUS: This is due to the expanding of the bone marrow. Are pathological fractures common in cases like this?

DR. GRATZKE: No. Primarily because these individuals are very inactive because of their anemia.

DR. PAUL HEISE: Sick cell anemia is a rare blood dyscrasia almost exclusively found in negroes, and characterized by varying degrees of anemia associated with specific alterations of the morphology and behavior of erythrocytes. It was first described in 1910 by Herrick. His original description was such that today, with our present knowledge of the condition, we can add little to his original dissertation. In 1911, Cook and Meyers, working with Emmel, studied a case

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of sickle cell anemia, and in their thorough investigation discovered that the father of their patient also had sickle cells in his blood. This was the first indication that there was a hereditary factor. Mason, in 1922, summarized the previous cases and decided that a separate disease entity had been discovered, and gave it the name of "sickle cell anemia." The terminology was rather loose until in 1920, Cooley and Lee discovered there were many individuals of the negro race who showed sickling in their blood, but who had no clinical manifestations of the disease. They called this condition sickle anemia to be differentiated from those with sickle cells plus clinical manifestations of anemia. The disease is almost entirely limited to the negro race. There have been reports of Greeks and Italians with sickle cells in their blood, but Laurence (1931) stated that there have been no unquestioned cases of sickle cell anemia in the white race. Cooley, in a series of 400 cases, found 7.5 per cent of the negroes with sickle cells in their blood; Randaue, with 150 cases, showed 6.6 per cent Graham, with 1,500 cases, showed 8.1 per cent, and Tomlinson with 275 cases, 6.5 per cent. Sydenstricker stated that 1.5 per cent of American negroes showing sickle anemia had sickle cell anemia.

The age of persons showing sickle anemia varied from birth to seventy-eight years. According to Mason, only three cases of sickle cell anemia have been reported past the age of thirty years, and no cases have been reported past the age of thirty-five years. The symptoms of the disease usually appear between the ages of one to ten and the patient is usually first seen at about the age of thirteen years. That heredity is the largest etiological factor that has been conclusively proven. The hereditary factor is a single, dominant, nonsex-linked Mendelian characteristic, according to Huck. In sickle anemia there are no symptoms or physical signs aside from the presence of sickle cells which may be demonstrated in the blood.

Sickle cell anemia shows the following symptoms: The patient has usually been ill and weak since infancy, with remissions and exacerbations, joint and muscle pain and fever. One of the most characteristic signs is severe abdominal pain which is believed to be caused by areas of infarction occurring in the spleen. The patients are usually weak and breathless after exertion. The sclerae have a yellowish tinge and there is moderate lymphadenopathy. The heart is enlarged and of the left ventricular type. A systolic murmur is often present. Ulcers may or may not be found on the lower legs about the ankles. The ulcers are usually large, punched out areas with granulating surfaces. There is usually hepatomegaly, and early in the disease, splenomegaly. The frequency of abdominal seizures determines the size of the spleen, which becomes smaller with each exacerbation.

The hematological picture reveals the red blood count to be often between one and three million, a low hemoglobin, with a color index below one, extreme characteristic poikilocytosis with as many as 50 per cent of the red cells being deformed, the majority of them being elongated, sharply pointed at one or both ends, with a tendency to be crescentic. The reticulocytes are increased from 20 to 40 per cent. There is leukocytosis from 15,000 to 30,000 with normal distribution. The platelets are normal, and there is usually a shift to the right of the Arneht count. Phagocytosis of red blood cells may be seen, both *in vivo* and *in vitro*. The cells stain more deeply and may have longitudinal striping. There is polychromatophilia, anisocytosis, and the normoblasts may be present in large numbers. There is often a diffuse punctuate basophilia.

There is increased resistance to hypotonic solutions of saline. Normal red cells begin hemolysis at .4 per cent and are completed at .36 per cent. In Cooley and Lee's cases average hemolysis began at .39 per cent and was completed at .25 per cent. Sickle cells are found to have more resistance to hypotonic solutions than the round forms. The sedimentation rate is increased and the

icterus index rises. There is usually a positive indirect van den Bergh. The bleeding and clotting times are normal. Gastric analysis reveals either a hypo or achlorhydria according to Dreyfus. The sickling phenomena may be demonstrated by allowing a hanging drop preparation or a paraffin ring preparation to stand. You then see deformity of the red cells ranging from triangular or quadrangular cells; filiform or crescentic cells. The cells seem to be influenced by the clotting and pressure of the cover slips. Huck states that if these cells are allowed to continue to stand, the sickle cells return to the normal shape of red blood cells. Sydenstricker believed serum to be essential to this sickling. Bell found no sickling to occur if the washed red blood cells were replaced in their own homologous serum. Red blood cells from sickle anemics sickled in normal homologous serum, according to Sydenstricker. Hahn and Gillespie showed that sickling readily occurred in decreased oxygen tension or where red cells were suspended in carbon dioxide, hydrogen or nitrous oxide. When these gases were replaced by oxygen, the sickle cells returned to normal shape. Cooley and Lee found that a preparation at incubator temperature the sickle cells disappear and leave only the round cells. They concluded that the cells of sickle cell anemia hemolyzed at incubation temperature in their own serum and normal serum, and that the serum of sickle cell anemia was not hemolytic for normal cells.

In cases of sickle anemia, sickle cells are found usually in all organs of the body in fixed tissues at postmortem. There are hemosiderin deposits in the liver, spleen and kidneys. The spleen is said to show malformation of the sinuses, especially about the Malpighian bodies, with pools of blood partly or completely surrounding the Malpighian bodies. There is abnormal development of the capillaries. The reticulum is not primarily abnormal. In sickle cell anemia, the leg ulcers which are found are not characteristic. The left ventricle of the heart is enlarged, and there is fatty metamorphosis of the myocardium. The spleen varies in size from 600 to 2 grams. The age of the patient does not determine the size of the spleen, but rather the spleen is shown to become smaller after many remissions and exacerbations. If atrophy takes place there is progressive capsular thickening with fibrosis. The liver is slightly enlarged and the sinusoids are engorged with blood, often there may be periportal fibrosis. The Kupffer cells can be seen to contain phagocytosed red blood cells and hemosiderin. There are islands of hyperplastic red marrow and areas of necrosis. There often is some intramembranous bone formation and evidence of increased hematopoiesis. On x-ray, porous and lace-like reticulation can be seen.

An attempt to explain the pathology and symptomatology of the disease was made by Bauer, who believes that all hemolysis was caused by mechanical impaction of masses of deformed red blood cells in the smaller blood vessels of various organs. This impaction with subsequent hemolysis and the resulting conglutinated masses, was responsible for the further pathologic changes and the clinical symptoms of sickle cell anemia. The liver, spleen, and kidneys showed this red blood cell engorgement and stasis. This stasis develops because the misshaped cells are unable to pass through the small vessels. This change is especially noted in organs with a slow blood flow as in the spleen, liver, or lymph nodes. This stagnation produces thrombosis, ischemia, infarction, fibrosis and resolution of red cells with subsequent anemia. The anemia is not constant and once the bone marrow can not compensate for the destruction, circulatory stagnation in the bone marrow, there results an impairment of the regenerative powers and further anemia. This is seen at postmortem in the large areas of infarction in the spleen caused by thrombosis. The liver is seen to be distended by red blood cells with necrosis of liver cells, but these are often microscopically seen to have areas of necrosis and corresponding thrombosis of the sinusoids. Many of the neurological signs

(Continued on Page 748)

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A PSYCHIATRIC BULLETIN IN MINNESOTA OF HALF A CENTURY AGO*

A Chapter of Psychiatric Journalistics

M. K. AMDUR, M.D.

Assistant Superintendent, Longview Hospital†
Cincinnati, Ohio

In November, 1891, the Hospital Medical Staff of the "Second Minnesota Hospital for the Insane" (in 1893, its name was changed to "Rochester State Hospital"), started the publication of a quarterly bulletin "to try to crystalize some of the results of our work in writing." During a two-year period, from November, 1891, to November, 1893, nine issues were published. The "Bulletin" was then discontinued because, "the majority of the profession have not, as yet, attained any great interest in mental diseases." It was indeed a brave undertaking for a small hospital staff; therefore, its fiftieth anniversary seems worthy of note.

In 1891 the "Second Minnesota Hospital for the Insane" had been in existence for about fourteen years. Originally, it was intended as a State Inebriate Asylum when the building was started in 1877. A year later, however, in 1878, by an act of the State Legislature, it was changed to the "Second Minnesota Hospital for the Insane." It was actually opened for reception of patients on January 1, 1879.

In 1891 the superintendent of this Hospital was Dr. A. F. Kilbourne (1858-1934), who was appointed in 1889 and continued to hold this position for forty-five years, until he died in 1934. The First Assistant Physician was Robert M. Phelps (1858-1928), who was mainly responsible for *The Bulletin*, and was its main contributor. He served on the staff of the Rochester State Hospital from 1885 to 1912; since 1892 as Assistant Superintendent. In June, 1892, he married a member of the Medical Staff, Dr. Sarah V. Linton. Both continued in the service. In 1912, Dr. R. M. Phelps was appointed Superintendent of the State Hospital at St. Peter, Minnesota, succeeding Dr. H. A. Tomlinson. He held the superintendency until 1925, when, because of failing health, he resigned and retired from active work, following which, he made his home with his daughters at St. Peter and Faribault, Minnesota. His wife, Dr. Sarah Linton Phelps (1859-1903), served on the Staff of Rochester State Hospital until 1898. She died of tuberculosis in 1903.

Besides these two physicians, in 1891, there were two more assistant physicians: Drs. N. M. Baker (1859-1928) and F. E. Franchere (1866-1934). In 1892 Dr. Franchere resigned and Dr. Eric O. Giere replaced him. He served a short time only, and was replaced by Dr. G. W. Moore, who a year later, in 1893, was replaced by Dr. Cyrus B. Eby (1872-1934). All these physicians participated in *The Bulletin*. Only one of them is alive today: Dr. Moore, who was born in 1870, and is retired at present. Dr. Eric Alonzo Giere, who was born in 1868, practiced in Saint Paul until 1921 when he moved to Minneapolis. His special

*Dedicated to the Fiftieth Anniversary of a psychiatric bulletin of the Rochester, Minnesota, State Hospital.

†E. A. Baber, M.D., is Superintendent of Longview Hospital.

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work for many years was general surgery. He had three sons, all of them physicians. The older two were associated with him in the so-called "Giere Clinic." Dr. Giere died February 12, 1942, at the age of seventy-three.

In the Introduction, Volume 1, Number 1a, (November, 1891), the editors of *The Bulletin* had stated:

We, as assistant physicians, organized ourselves into a society to meet once a week for the purpose of discussing types of mental disease, and other matters of interest connected with our work. This (*Bulletin*) is entirely a private enterprise, maintained at our own expense, we, publishing the results and observations of our work in this way, that they may be useful. Another reason for this work may be found in the knowledge that the multiform misconceptions of our work, and our situation here, are founded directly in a lack of knowledge of the methods and means, as well as the difficulties in our labor. These misconceptions we see to exist everywhere. A physician called here only some days ago, and after going about the "house" asked where the "cells," or the places to keep the "bad ones" were?

As already mentioned, Dr. R. M. Phelps was the "soul" of *The Bulletin* during the two years of its existence. His papers, articles and notes dealt with subjects such as Paranoia, General Paralysis, Strychnine in Inebriety, The Hospital Idea, Influenza (in relation to mental patients), spells or periodicity in Insanity, Renal Diseases Among the Insane, Administrative Topics (such as: The Extent of Administrative Power, Style of Buildings, Types of Dining Rooms, Open Wards, The Proportion of Attendants, Wages of Attendants, Amusements, Occupations, et cetera), Graduation of Responsibility in Insanity, Clinical Studies in Insanity, and so on. Dr. Phelps was a very progressive psychiatrist, conscientious, devoted to his work, and kept abreast with everything going on in psychiatry here and abroad. He was respected and liked by all who knew him. He was active in the county and state medical societies, contributed many papers and articles in the current periodicals, and published textbooks on nursing (one of them in collaboration with his wife).

The other members of the Staff did their share, too. Dr. S. Linton (as already mentioned, since 1892 S. Linton Phelps) discussed in her papers and notes topics such as The Training School for Attendants in Asylums for the Insane, Gynecological Work Among the Insane, Autopsies, Phthisis Among the Insane. It is of interest, that there has existed in the Rochester State Hospital since 1889 a training school for attendants; and since 1890, a training school for nurses. Dr. W. J. Mayo was one of the lecturers on Surgical Procedures. The number of autopsies was comparatively large: about sixteen yearly.

Dr. N. M. Baker wrote on Acute Delirious Mania; reviewed current periodicals, et cetera.

Several outside physicians contributed to *The Bulletin*. Thus, Dr. H. A. Tomlinson, of the St. Peter (Minnesota) State Hospital, discussed Selection, Preparation and Serving of Food to the Insane; Dr. C. Eugene Riggs, Professor of Nervous and Mental Diseases at the University of Minnesota: Some Notes on Scotch Asylums, Some British Alienists, et cetera.

Dr. Elizabeth C. Mallison, Assistant Physician at the St. Peter State Hospital, contributed a paper with a curious title: Report of a Case Exhibiting the Symptoms of General Paralysis, but in which the Postmortem Disclosed Syphilitic Brain Disease (*Sic!*). It is also of interest that Dr. R. M. Phelps discussing general paralysis in one of his papers mentioned: "The operation of trephining for the relief of some cases of this trouble (general paralysis), especially those in which localizing brain symptoms can be found, seems to be a ray of light shining through the general therapeutic darkness which envelopes the subject."

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Many interesting items are scattered through the pages of *The Bulletin*; for instance, here are samples of questions offered during examinations to candidates for interns in State Hospitals of Minnesota:

1. Name the various forms of defective mentality, giving a definition of each.
2. Define and illustrate the insane beliefs.
3. Define dementia, naming its different types. Explain what you understand by "acute mania," "primary dementia," and "secondary dementia."
4. Define the different varieties of stupor, naming its classical divisions. Also, describe a typical case of stuporous insanity, giving its prognosis and treatment.
5. Describe a case each of puerperal, lactational and climacteric insanity, giving their prognoses and treatment.
6. Is impulsive insanity invariably attended by the insane beliefs? State at what period of life this predisposition tends to assert itself. Also, state under what conditions the homicidal impulse is most likely to manifest itself in epilepsies.
7. Describe the different types of melancholia. Explain what you understand by "Raptus Melancholicus" and "Precordial Fright." Give the treatment of this disease.
8. Name the varieties of mania. Under what divisions does the moral insanity of Pritchard fall? Explain the meaning of "Folie Raisonante," and give a brief description of "Délire Aigue," with its prognosis and treatment.
9. Explain what you understand by "Folie Circulaire," "Folie á Double Forme," and "Katonía."
10. Describe the best manner of artificial feeding. Also give the dosage and the best manner of administration of such hypnotics as sulphonal, paraldehyde and chloralamid. Also describe minutely the hypodermic use of hydrobromate and hyoscine.

The number of patients of the Rochester State Hospital, about the time *The Bulletin* was started was around 1,050. The following table shows the movement of population for the biennial period July 31, 1890-July 31, 1892:

Total number on July 31, 1890.....	1,034
Out on trial visit, July 31, 1890.....	67
Remaining on July 31, 1890.....	967
Admitted during period.....	625
Returned from trial visit.....	3
Sent away on trial visit.....	327
Eloped	23
Transferred to St. Peter State Hospital.....	50
Died during period.....	135
Discharged as recovered.....	176
Discharge improved	135
Discharged unimproved	24
Remaining in Hospital, July 31, 1892.....	1,058
On trial visit, July 31, 1892.....	78
Connected with Hospital, July 31, 1892.....	1,136

Some amusing points may be selected from the pages of *The Bulletin*. For instance, the following note: "The men are to an extreme degree more capable of organized and good work. I do not hesitate to say that the male side is ahead by at least three times. This is true, too, right through work appropriate for women—bedmaking, dishwashing, et cetera." Of course, this note is unsigned, but the sex of the author is not difficult to guess.

The abstracts of the current medical periodicals were numerous, and included journals, such as *American Journal of Insanity*, *Review of Insanity and Nervous Disease*, *Journal of Mental Science* (London), *Brain* (London), *Alienist and Neurologist*, *Philadelphia Medical News*, et cetera.

Some of the advertisements are of no less interest than the context itself. For instance, an advertisement of an "Instantaneous Electric Lighter," that "a child can operate" (Price \$5.00; with Medical Coil and Hand Electrode, \$5.50). Of

HISTORY OF MEDICINE IN MINNESOTA

still greater interest, is an advertisement by Smith & Davis Mfg. Co., St. Louis, Missouri, about "Protection Bed for the Insane" (No. 46, Size 6 ft. 3 in. by 2 ft. inside; weight 350 lbs.) It looks like a cage for animals.

It is remarkable that the current medical press practically ignored *The Bulletin*. A few journals had brief notes about its appearance. Only the *Review of Insanity and Nervous Disease* stated, after commenting favorably on its papers: "We are able to commend this new departure in hospital work, and hope that it will be continued by the officers of this institution, and that others may emulate this example. If every institution in America had such a publication, an immense amount of material that is now going to waste, would be saved to the profession."

There is fascination in watching the movement of that lightless multitude, whose names have paled in the twilight, and there is a real and abiding thrill in the perusal of the defunct journals, with their generous and dated rhetoric; their yellowed pages bring back the remote strangeness of other days, and give one the opportunity of seeing one's period in proper perspective. This is perhaps the main value of historical investigations.

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EXTRA B VITAMINS WOULD HELP BRAIN WORKERS

Brain workers apparently would be able to do more and perhaps better work, or at least could do their regular work with less fatigue, if they increased their daily ration of B vitamins above the amount required by the average healthy person. Those who perform physical work, however, need not expect any increase in muscular strength or endurance or any lessening of muscular fatigue through taking extra amounts of B vitamins.

These are the conclusions of studies reported by Dr. Ernst Simonson, Dr. Albert Baer and Dr. Norbert Enzer, of Milwaukee.

The Milwaukee scientists gave a large surplus of the vitamin B complex to 12 healthy persons and compared them with 11 people on an ordinary diet. The extra vitamin ration had no detectable effect on any type of muscular activity, neither endurance, recovery, speed, force nor fatigue, but it did prevent fatigue of the central nervous system, which includes the brain.—*Science News Letter*, April 11, 1942.

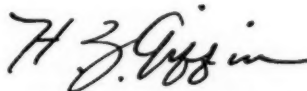
President's Letter

MEDICAL CARE FOR CIVILIANS

THE immediate duty of the medical profession is to obtain physicians for the various services. Minnesota will have to supply about 200 more physicians before January 1. The required number of doctors will have to be obtained in some way. Everyone recognizes that the individual decision is difficult. Physicians are needed at home and they are making a real contribution, both on the home front and in military service, and all are working harder than ever before. It is a problem for each man to solve in communion with his own conscience and according to his own peculiar situation in the community. This subject is covered in an editorial in this issue, which everyone should read.

Hand in hand with supplying physicians for the services goes the task of satisfactory medical care of the civilian population, and it is this that I wish to discuss especially. Articles and editorials are appearing in the lay press calling attention to communities without medical care and jumping quite unjustifiably to the conclusion that group practice, prepayment plans, or some type of state medicine will solve the difficulty, whereas experimental schemes at this time would only throw sand in the gears. In general, through this period the physician should continue to practice as he has been accustomed to practice; more good will be accomplished in this way. However, the physicians of each community and district should meet and devise methods by which each particular district can be properly protected. First, office hours can be arranged for affected towns by doctors in surrounding communities. This has been successfully applied in some places. Second, in some small cities, group effort in dividing the work may be feasible, whereby a doctor who is too busy at a given time may be assisted by others who are not occupied at that time. Third, where the situation cannot be satisfactorily covered, it may be possible through the offices of the State Medical Association to find a locum tenens physician. Some male physicians are physically disqualified for service on completing their internship and no women physicians are taken into military service. These two groups form a pool which will make available for service in various communities about 10 per cent of the physicians who complete their internship each year. Members of these two groups should be asked by the Procurement and Assignment Service to volunteer for civilian service wherever they are needed. The experience in private practice would be valuable to them. Retired physicians are also available for locum tenens service. Fourth, there should be a center of medical information in each county. The office of the chairman of the county Advisory Committee or the local health office might be designated and advertised as such an information bureau. In this way, a record also can be obtained of the actual needs in each district. If people cannot obtain information locally, they should be instructed to write to the offices of the State Medical Association in St. Paul. It is our responsibility to see that medical care is obtained where a bona fide need is demonstrated. In general, it is essential that each small town or community be covered in some way, and second, that doctors in each community meet and consult to see that medical care is being administered satisfactorily.

Medical care for expanding industry and the resulting boom towns is a matter for consultation between the officers of the industry involved, the State Department of Health, local health officers, and officers or committees of the local and state medical societies. Many special problems are involved in each industrial locality, and the situations differ. A special Allocations Committee, working in close association with the Procurement and Assignment Service, is under consideration to provide physicians and surgeons for industrial practice and for civilian needs.



President, Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

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WATER BALANCE*

THE commonest use of intravenous therapy is
to correct water, salt, sugar, plasma and red
blood cell deficiencies. All of these deficiencies
involve variations of osmotic pressure. The sur-
geons have contributed largely to the technique of
giving fluid intravenously and also to the method
of computing how much fluid to give. However,
the most common abuse is found in surgical rou-
tine by using fluids intravenously without regard
to cardiac, renal or osmotic imbalances. To eval-
uate these factors, a highly developed technical
staff is essential. This is not prevalent in all
hospitals. It is a safe guess that the need for ad-

justment of water and electrolytic balance is
more prevalent in hospitals with the lesser tech-
nical equipment, for the simple reason the hos-
pital population is larger. But even in the high-
ly equipped and specialized hospitals the accu-
rate adjustments of such balances are not al-
ways accomplished successfully. The reasons for
this are as follows: there is no absolute measure
of cardiac efficiency; renal tests may be mislead-
ing; the riddle of water flow in the body is still
unsolved.

Two years ago at the University of Minne-
sota there was a round-table discussion on this
very subject.¹ Dr. Peters, of Yale, was asked
what criteria to use for determining the amount
of salt to give. Was it the measure of the vas-
cular bed, was it the measure of the excretion of
the kidneys, was it the measure of the amount
of gastric fluid which was removed, or was it
the clinical picture as a whole? Dr. Peters re-
plied: "It has been asked how we found out
that people were hydrated or dehydrated? Well,
we can't at the present time. We are peculiarly
unable to do so. At present, we must rely on the
elasticity of the skin, the general state of the
circulation, whether the blood pressure has fallen
too far, the serum proteins, etc., but most of all
you must look at the patient. No amount of
chemistry will eliminate accurate clinical obser-
vation."

And again,² "Despite the specific directions
which many have offered for determining the
amount and character of the fluid requirements
of the surgical patient from the hematocrit, blood
count, blood or plasma specific gravity, blood or
plasma chlorides and plasma or serum proteins,
the writer inclines to the opinion of those who
hold that the desired information cannot be ob-
tained by any conceivable combination of tests
of the state of the blood. However eager one
may be to employ "a rational method" in the
administration of fluids, the available laboratory
aids by no means preclude a consideration of
the pertinent clinical factors."

It is for this reason that some of us look
askance at the facility and frequency with which
the equivocal intravenous route is used. It is for

*The substance of a discussion entitled "The Use and Abuse
of Intravenous Therapy" given in Duluth at the State Med-
ical Meeting, July 2, 1942.

this reason that some of us, who see the spectacle of pulmonary edema following the injudicious use of parenteral fluid, have nothing but the greatest sympathy for the clinician in charge. How can he know how much salt and water to give when such men as Dr. Peters, the eminent student of this problem, do not know.

The ease by which the various drug houses have made available the different apparatus and solutions for intravenous therapy has contributed to the momentum of its widespread use. The tendency to routinize surgical patients in regard to fluids, in which the trend toward standardization has led us, also adds to its promiscuous use.

Then, too, the use of gastric and duodenal siphonage by the nasal tube has also confused the problem. This extremely useful bit of machinery can suck more chlorides out of the intestinal tract in twenty-four hours than can be put back into the body (by veins) in the same time. Its proper use is highly commendable. Its promiscuous use is extremely questionable. To make sieves of postoperatives is a clinical incongruity. I have yet to be convinced that any correctly made intestinal or gastric anastomosis will limit the function of the viscus to the point at least where it will cease to propel fluids down the tract. I am positive that giving fluids by mouth has not been tried sufficiently. The fear of vomiting and distention has kept the clinician from experimenting with this method.

The body fluids are supposed to be in a state of osmotic balance. They are never really so. There is a large margin of recovery if this balance is disturbed. Undue interference on the clinician's part merely adds to the osmotic confusion. To attempt to correct marked variations in a limited time may be dangerous. I am not thinking so much of the strain on the circulating apparatus; I am thinking of the strain on the cellular metabolism of permeable membranes. We seem to forget that these cells are not just porous membranes. They are subject to fatigue just like other cell systems of the body. It is in the older group of patients that the most critical surgical procedures occur. It is in this group that permeable membranes are reduced in area. The sclerosing process is not limited to the blood vessels but involves the capillary beds. It is in this group that intravenous therapy needs more care than in the young. I wish to advance the premise

that fatigue and not cardiac insufficiency alone is a factor in some of the pulmonary edemas we see after use of parenteral fluids. The irreversibility of this condition is very suggestive that injury to membranes may be a factor.

Since we have no absolute measure of cardiac integrity, since the renal tests may be confusing, and since the water activities are still an unpredictable factor, it behooves us to give fluids by vein cautiously and slowly. There is not a single formula for computing the amount of fluid that applies to any single case. Formulas are necessary, but accurate clinical examination of the patient, and judgment, must be the ultimate guide we must use in giving parenteral fluids.

The weighing of the patient daily, as advocated and practiced by Dr. Wangenstein, is probably the best physical means we have today for guidance in giving fluids. But that method too must be supplemented by frequent and accurate clinical observation, with the addition of good clinical judgment. Water taken by mouth differs in its activities in the body from water given by vein. Whenever possible, let us give fluids by mouth.

—H. L. ULRICH.

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MALNUTRITION IN INDUSTRIAL WORKERS

WHILE the incidence of malnutrition in our country has been grossly exaggerated in certain quarters, there is undisputable evidence that it does exist to considerable extent in the population at large. This is more evident in the South, particularly among the negro population, as proven by the prevalence of pellagra. However, there is evidence of more malnutrition in the north Atlantic states than in the rest of the country, especially the far West. In addition to those individuals who have clinical evidence of malnutrition there is a considerable percentage of the population who are not properly fed and who would be more efficient if corrections as to kind and amount of food were made in their diets. Important as the subject is in time of peace, it is doubly so in time of war.

The first report of the Committee on Nutrition in Industry of the National Research Coun-

EDITORIAL

cil has recently appeared and contains much valuable information.

The report calls attention to the experience in England where undernutrition was frequently encountered among industrial workers and where additional feeding resulted in increased output and fewer accidents. While there is little information available at present as to the diet of industrial workers in this country, the Committee on Nutrition in Industry has compiled certain facts and makes definite recommendations.

Industrial health practices in this country have been largely restricted to the prevention and cure of occupational diseases and accidents. Astounding progress has been made along this line. The question of proper nutrition has been given almost no consideration.

That employers are becoming more interested in the subject of better nutrition of their employees is evidenced by the fact that some of them are distributing synthetic vitamins to their employees. This is being done without preliminary study of the nutrition problem of their employees. The Committee does not recommend the procedure. If diets are deficient they should be brought up by natural foods, for "supplementing the diet with synthetic vitamins fails to make provision for deficiencies in proteins, fats, carbohydrates, minerals and the numerous accessory factors which have not been made available in crystalline form, but are nevertheless essential for the maintenance of health." "Diets which are poor enough in one factor to lead to a nutritional deficiency are most likely to be poor in several other factors as well." "In their pure form, vitamins are tools of great precision, invaluable when used by skilled technicians. It would be a tragedy, should their indiscriminate use in unskillful hands throw discredit on their tremendous potentialities for human benefit."

Under the subject of nutrition in general the report calls attention to our poor food habits. Jolliffe has called attention to the fact that the adolescent boy is too likely to stop drinking milk as soon as he dons long trousers. "The amount of candy sold in this country in 1939 was sufficient to furnish 90 calories per capita per day. The amount of alcohol consumed in the United States in 1938 was sufficient to furnish 86 calories per capita per day, and probably exceeded 200 calories per person of alcohol-consuming age." In addition there are the sweetened carbonated beverages which are so popular. All of

these contain no vitamins and are commonly substituted for the calories of essential foods.

Attention is called to our commissary, defective in many respects. Highly milled grain, refined sugar and loss of nutritive value through improper cooking are mentioned.

The Food and Nutrition Board makes specific recommendations. It recommends the enrichment of white flour with vitamin B and iron, the use of whole grain, iodized table salt, oleomargarine fortified with vitamin A, to furnish a cheaper substitute for butter.

Progress in improving the nutrition of the industrial worker will depend on several factors. The ability of the worker to buy the proper food depends on his wages and the cost of proper food. Education in dietary matters is fully as important. The worker must know that he cannot work well on a breakfast of doughnuts and coffee. Industry can do much to educate employees by means of pamphlets, serving substantial meals and the employment of a dietitian in large industrial plants.

As a concrete example of the proper daily consumption of a worker, the Food and Nutrition Board of the National Research Council, gives the following: at least one pint of milk; two servings of potato; two servings of fruit, one of which should be a citrus variety or tomato; two vegetables; one egg; one serving of meat, fish or poultry; a cereal dish (whole grain); whole grain or enriched white bread at every meal; butter or fortified oleomargarine, the remaining calories to be supplied by a choice of vitamin-rich foods.

The study of nutrition of the industrial worker and the population in general is receiving great impetus as a result of the war. Its permanent effect on the health of our people should prove one of the few good results of World War II.

TEST FOR VITAMIN NEED

A simple test for determining who needs vitamins and who is already getting enough of them was announced by Dr. V. A. Najjar and Dr. L. Emmett Holt, Jr., of Johns Hopkins University, at the meeting of the Federation of American Societies for Experimental Biology. The test is made after a twelve-hour overnight fast.

If, during the thirteenth hour, the person tested is still excreting vitamins via the kidneys, he probably has a good surplus and does not need any more than his diet has been furnishing. If he is not excreting them thirteen hours after dinner, he probably needs to take more vitamins. The test so far has been limited to three of the B vitamins—thiamin, riboflavin and nicotinic acid.—*Science News Letter*, April 11, 1942.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

APPEAL TO YOUNG PHYSICIANS

When the House of Delegates met in Duluth the coöperation of the entire medical profession of the state in providing Minnesota's quota of medical officers for the Army and Navy was promised by official action of the delegates.

But applications for commissions subsequent to the meeting have not fulfilled that promise. For that reason, a new appeal directed to available physicians under the age of thirty-seven and to unmarried older men up to age forty-five is now being issued by the Committee on Procurement and Assignment.

No one doubts the essential patriotism and serious purpose of most of the men who have failed, so far, to volunteer their services. There are many compelling individual reasons for delay. Many men in this group are known to be arranging their affairs with the intention of entering the service of the Armed Forces at an early date and the committee is well aware that extraordinary difficulties are involved in dropping an active practice and in adjusting family requirements and responsibilities.

Need Is Urgent

But the problem is not now one of ultimate intentions but of immediate needs. Large scale troop movements and the opening of offensive action in the Pacific and the Atlantic make the immediate need for physicians more urgent than any personal or private problem that may be keeping eligible physicians at home. Minnesota must have its full quota of 900 in the service by December 31 of this year, and we are still more than 200 short of that goal.

The fact that all Army physicians are not constantly employed in care of the sick and wounded does not mean that the full quota is not urgently needed on the line of duty now. Neither firemen nor police officers are constantly employed in fighting fires and pursuing law breakers; but a

full staff must be present and ready for instant action if civilian life is to be safe.

Man Power to Be Conscripted

Selective Service is now exhausting its reservoir of young men and of older men without children. The time for drawing upon all men under forty-five is drawing closer and no exception can be made for physicians, especially in view of the fact that commissions are available to all of them.

There is another aspect of the situation which should serve as a potent stimulus to early action. In the event that the necessary number of physicians and other professional personnel does not apply in time, there is no doubt that Congress will pass special legislation conscripting all man power. It is possible, also, that the President may take the matter of procurement and assignment of physicians entirely out of the hands of the medical profession and restore it to the War Department and the Selective Service system. Either action would place medicine in a sorry light and greatly hasten the day of federal control of medicine.

Do It Now

Letters have been sent by the Committee on Procurement and Assignment to all available physicians under the age of thirty-seven, plus a few others in special categories, who have been classified by their own local committees as available from the point of view of community need.

It is clearly the duty of these young men to enter the service of their country now.

NEW TASK FOR N.P.C.

An editorial appeared in the August issue of MINNESOTA MEDICINE which briefly described recent and proposed activities of the National Physicians Committee. Members of our state association who contributed to the support of this

organization undoubtedly were pleased to know of the progress accomplished. At their recent meeting, the A.M.A. House of Delegates passed a resolution approving the policies and the activities of the N.P.C. The question is often asked why does not the A.M.A. carry on those activities. It is quite obvious to all who are familiar with the organizations of the A.M.A. that it cannot employ methods used by N.P.C. to influence public opinion in regard to the merits of the present form of medical practice nor in the participation of political activities.

Organization Essential

An organization such as the N.P.C. is essential to the protection and continuance of the principles of the present form of medical practice. Although every physician who has been engaged in the actual practice of medicine knows that federal control would lower the quality of medical care, it is difficult as well as costly to give this information to the public. It is almost impossible to compete with the wide facilities available for propaganda by social theorists in the present administration.

N.P.C. is dependent on voluntary contributions by physicians and their friends for funds to carry on its activities. Unfortunately, these have been limited in amount and insufficient to employ the usual methods of publicity extensively.

Only Recourse

An opportunity now presents itself to supporters of the N.P.C. which deserves especial consideration. You are all familiar with the results of the trial in Washington which ended in conviction of the A.M.A. for violation of the Sherman Anti-Trust Act. By an unlooked for interpretation of that law the professions were included with the trades. And by a still more unexpected interpretation, the labor unions were exempt from any implications. This interpretation has been sustained by the Court of Appeals and a plea for reconsideration is now before the Supreme Court. It is quite obvious that if the lower courts are sustained the present methods of conducting medical care and the code of medical ethics will be severely handicapped. Medical organizations will find it difficult to carry on with activities which experience has shown to be in the best interest of medical practice as well as of public health. As Judge Mitchell of the Appellate

Court stated in rendering the verdict, the only recourse left to the professions would be an amendment or reinterpretation of the Sherman Act which would exclude the professions.

With this end in view, the N.P.C. is starting out on a campaign to influence Congress to consider such modification of the Sherman Act. Many of you have received circulars urging participation in this campaign. In Minnesota we are fortunate in having a Committee of the State Association which is experienced in matters of this kind and which can be relied on to do everything possible to accomplish these objectives.

Minnesota Well Situated

Unfortunately, however, there are but few states which are so well situated as we are in respect to legislative matters. Plans are being made so that an active legislative committee will be set up in every state which will function along similar lines to that now existing in Minnesota. It would seem that with the cooperation of the other professions a profound influence can be brought to bear upon the members of Congress to correct what was apparently an oversight in drawing up the original bill passed in 1897. It is self-evident that the authors had no intention of including the professions.

It seemed advisable to start this campaign now in order that our efforts would be recognized prior to the November elections. Careful plans are being made for future action with the advice and cooperation of the other professions. However, we will need most of all the personal support of every physician who is interested in preserving our American form of medical practice. You will be kept informed as to methods by which you can be of aid.

INSURANCE STUDY NEEDED

The problem of medical expense and how to meet it is likely to be with us for a long time.

Hospital expense is now satisfactorily handled for a large number of people by the insurance method and Minnesota is especially fortunate in the wide coverage, here, of group hospital insurance, a coverage which is being steadily extended.

Most discussions about the costs of sickness relate, nowadays, to the possibilities of insurance

coverage by some comparable method for medical expense.

In their attempts to meet this problem, a number of states have placed themselves in a difficult, not to say anomalous position. Several medical associations have secured passage of enabling acts granting them special privileges in the organization of medical insurance plans and the physicians appear to have failed to make satisfactory use of those privileges. One of them is now threatened with amendments to the legislative act which gave the physicians exclusive organizing rights for the reason that medical efforts in the field have not been effective.

Clearly, a very careful study of all aspects of the problem, including the probable support of both doctors and public, is needed before any request for special legislation is made.

Success Is Limited

So far, no single instance of a verified and unquestioned success has come to the attention of this committee where doctors have organized their own plans on a state-wide basis. Medical plans appear to have succeeded only where there is a limited group of doctors working as a unit or where there is an unusual situation such as a hospital center which serves a closely knit industrial community and where errors are easily corrected and control is simple. Organization of larger groups involves difficulties and disproportionate expense.

Physicians should therefore proceed with great caution in this matter. They should make exhaustive studies before arriving at any final conclusion as to whether to leave the field to outside organizations, coöperative or commercial, including the established insurance companies, or whether to step in themselves and take the grief.

Medicine Must Be Ready

Obviously war and the shortage of physicians complicates the problem. Most people agree that new social experiments should not be undertaken now. At the same time, most people also feel that the question of medical expense must be met eventually and that post-war problems, including the return of physicians from the fighting forces and a probable post-war depression, will bring renewed clamor for insurance against medical costs. Organized medicine must be ready for that situation.

MEDICAL BILLS IN CONGRESS

Among wartime measures immediately pending in Congress, physicians will be especially interested in a proposal to amend the Social Security Act so as to provide medical care for recipients of Public Assistance. The bill embodying this proposal, H. R. 7411, was introduced by Representative Coffee of Washington and is now pending in the House Committee on Ways and Means.

It provides for federal grants to assist states in providing medical and hospital care, nurses' services, drugs and other medicines and prosthetic appliances for the aged, the blind and dependent children who are recipients of public assistance under the act and also to needy members of their households. It will be administered by the states according to plans approved by the Social Security Board through a single state agency, the actual care to be supplied either directly through the state agency or a local agency or indirectly through payments by the state or local agency to the doctors or hospitals furnishing the care.

For Major Illness

In Minnesota medical care for recipients of public assistance is now supplied by physicians of the recipients' choice with funds especially allotted for such payments to the recipient. But such funds must come within the limit allotted by law to each recipient. The method works well for minor illness and for predictable medical needs. Costs of major, unpredictable, illnesses must often be paid out of relief funds or on a long term basis out of small monthly allowances or they are borne by physicians and hospitals providing the care.

It is the contention of Representative Coffee that this procedure is unsatisfactory and, under the proposed amendment, "the requirements of the individual for medical care would be met instead through a procedure whereby it is possible to pool the risks with respect to medical care and to set up state and local plans which will assure more effective services for recipients of assistance, which will make such services more easily and promptly available to them, which will make possible more effective use of funds by assistance agencies and which will result in greater fairness to physicians, hospitals and others providing care who now encounter frequent and irri-

tating difficulties with respect to payment for their services."

The principle of payment out of pooled federal and state funds for medical service to recipients of public assistance is already established in Minnesota. As a result of the close coöperation between the Division of Social Service and the Minnesota State Medical Association the recipient of public assistance, like the relief client whose privilege is written into the laws of the state, has free choice of physician for such service. Increasing the funds available for that service would not, in all probability, change the plan already in satisfactory operation in the state.

Open to Abuse

Extension of the service to needy members of the household, might add abuses, and extend the basis of care beyond those for whom the state and federal government should assume responsibility.

Such legislation requires the careful study of all who participate in the plan for care of the needy sick, remembering always that Social Security legislation is the avenue through which advocates of government medicine are most likely to promote their plans.

For Chiropractic

The bill introduced by Representative Tolan of California to permit injured or disabled federal employees coming within the United States Employees Compensation Act to be treated by chiropractic and in chiropractic hospitals, within the scope of the laws of the individual states, is now pending on the Union calendar of the House of Representatives. Bills on that calendar may be brought up for consideration under a special rule approved by the House Committee on Rules. Osteopathic services were made available for these employees under the same limitation under the act of May 31, 1938.

Pharmacy Corps

Establishment of a Pharmacy Corps in the Army is proposed in H. R. 7432 by Representative Durham of North Carolina and by Senator Reynolds in S. 2690 both pending the House and Senate Committees on Military Affairs.

The act would replace the Medical Administrative Corps with a Pharmacy Corps and permit trained pharmacists to replace physicians in

many duties having to do with the purchase, storage, transportation, compounding and dispensing of drugs. It would release many physicians, according to its sponsors, who are now performing tasks which could be handled as well or better by pharmacists.

Veterans

Medical and hospital treatment for veterans of World War II on a parity with veterans of World War I, is proposed in a bill introduced by Representative Rankin of Mississippi. This bill is pending with a favorable committee report and will undoubtedly be enacted, thus setting in motion the increase in activities and facilities in the Veterans' Administration which is likely to go to unimaginable lengths as a result of World War II.

More Government Wards

The possibility of civilian casualties from air raids and sabotage adds other probable thousands to the injured soldiers and sailors who will make up the mounting lists of government wards at the end of this war.

The Civilian War Benefits and War Relief Act of 1942, introduced as H. R. 7415 and pending in the House Judiciary Committee, proposes benefits for complete medical and hospital care for personal injuries sustained by injuries if they arise due to a war risk hazard arising after December 6, 1941.

Cost of medical benefits may be paid directly by way of reimbursement or may be paid to the persons furnishing the benefit, the amount to be dictated in regulations of the Administrator of Federal Social Security. It will be in the province of the Administrator also, according to this bill, to determine whether government or private facilities may be used.

COMPENSATION IN RHODE ISLAND

The first state sickness compensation act has just been passed in Rhode Island.

It provides for weekly benefit payments to employees who are ill in exchange for contributions of one per cent of their pay to be taken out of their wages in the same manner and under virtually the same administrative setup as for other contributions made under the Social Security act.

IN MEMORIAM

Amounts of weekly benefits range from a low of \$6.75 for the lowest paid workers to a high of \$18.00 for those receiving three thousand dollars a year or over.

Cash benefits for illness have been recommended repeatedly by the President and backers of the present social security legislation and the workings of the Rhode Island plan will undoubtedly be watched with interest.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

St. Paul Woman Sentenced for Unlawful Practice of Healing

Re: State of Minnesota vs. Assunda (Sue) Willner

On August 4, 1942, Assunda (Sue) Willner, thirty-two years of age, 343 West Central Avenue, Saint Paul, Minnesota, entered a plea of guilty to a charge of practicing healing without a basic science certificate. After a searching inquiry into the facts, Judge Hugo O. Hanft of the District Court of Ramsey county sentenced the defendant to one year in the county jail and placed her



on probation for the next year on the following conditions:

1. Refrain from practicing healing in any manner whatsoever;
2. Refrain from having any patients in her home;
3. Refrain from having any old age assistance recipients in her home as boarders, roomers or otherwise.

The defendant was arrested July 20, 1942, by Saint Paul police after it had been reported that the defendant had attempted to perform an abortion on a married woman living at White Bear Lake. It was alleged that the attempt took place in April, was a failure and that the same woman had returned for the same purpose. The "patient" gave a written statement in which she claimed she paid the defendant \$35 and was "examined" by her. When police went to the home of the defendant they found several old age assistance recipients, a waitress from Minneapolis and the "patient." The Minneapolis girl gave a statement in which she claimed that she had gone to the home of the defendant to have an abortion performed and that she had paid down \$15 but had not had any treatment.

The defendant has had no medical training of any kind but had made inquiry in March about obtaining a license for a "rest home." She was advised by the State Department of Health that they would not issue one for her place. Judge Hanft denounced the defendant's activities and told her that one single complaint in the next year would result in her probation being revoked and her going to jail to serve her sentence.

In Memoriam

George Ketcham Hagaman

Dr. George Ketcham Hagaman, prominent pediatrician of Saint Paul, died at Miller Hospital July 11, 1942, following an illness of about three months.

Dr. Hagaman was born December 9, 1875, at Pennington, New Jersey, the son of Joseph Hagaman and Mary Ketcham Hagaman. His parents moved to Saint Paul in 1887. He graduated from the Saint Paul Central High School in the class of 1893 and was then employed by the Great Northern railroad company until the fall of 1899, when he entered the medical department of the University of Minnesota, graduating in the class of 1903. He served as intern in the City and County Hospital of Saint Paul from June, 1903, to June, 1904. Following his internship he moved to Anoka, Minnesota, where he engaged in general practice until 1918. In 1909, he did postgraduate work for a short time in Vienna. In 1918, he spent some time at the University of Minnesota specializing in pediatrics. He then came to Saint Paul where he became associated with Dr. Walter R. Ramsey, and later with Dr. Alexander Stewart. Together they formed the Children's Clinic of Saint Paul which existed until 1928, when the Children's Hospital was built. Dr. Hagaman then established an office by himself and continued so until his death.

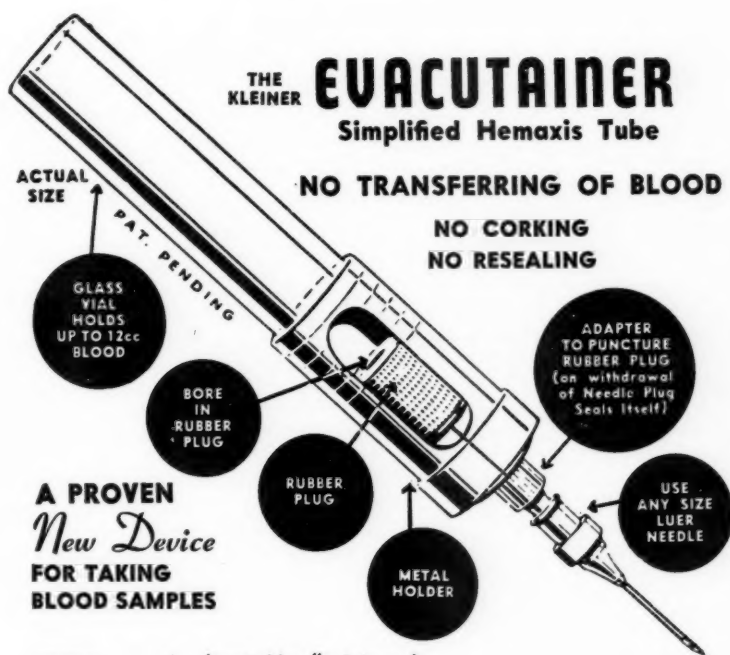
In 1904 he married Mary Wilson Fagundus who, with three children, survive him. The children are, George K. Hagaman, Jr., of Pittsburgh, Mrs. Wm. Ives of Baltimore and Mrs. Townsend Corning of Radburn, New Jersey. Four grandchildren also survive.

Dr. Hagaman, at the time of his passing, was a member of the Ramsey County Medical Society, the Minnesota and American Medical Association, and the American Academy of Pediatrics. For many years he served on the teaching staff of the University of Minnesota. In 1937, he served with distinction as president of the Ramsey County Medical Society.

Dr. Hagaman was a successful general practitioner and became one of our leading pediatricians with a large following. He was, in every sense, a physician. An indefatigable worker, he gave of his time and best efforts to all his patients, regardless of their financial status. He was a close observer of patients, and was endowed with a remarkable memory for details of condition of patients, of differential diagnosis and treatment. His genial personality and excellent judgment, his kindness and honesty, combined with an unusual knowledge of medicine, made him outstanding in his specialty.

CARL L. LARSEN, M.D.

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INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

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F. J. Elias, Duluth

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SILICOSIS AND TUBERCULOSIS

The relationship of occupation to tuberculosis may be considered from two points of view. The first, which has already been discussed in this column, relates to the possibility of the discovery of tuberculosis by survey methods among large groups of workers. The second phase of this problem, which is an important responsibility of industrial medicine, is occupying much thought on the part of public health officials. It relates to the development of tuberculosis as the direct result of an occupational hazard. Whereas in the first group we are concerned with the detection of tuberculosis and the prevention of its spread, in the second group we are interested primarily in the possibilities of prevention of tuberculosis in the individual as a result of the work he is doing.

Silica-free Dust

Tuberculosis as a direct result of occupation is almost entirely concerned with the factor of dust inhalation. As such it has been studied for a great many years, yet the problem is so complex and has so many variables that it is foolhardy to be categorical or dogmatic about it. Certain facts are reasonably well established and give a working basis for further investigation. It seems reasonably certain, for example, that dusts which do not contain substantial amounts of free silica, noxious gases, and poisonous metals do not in themselves tend to increase the incidence of tuberculosis amongst the workers exposed to them. No matter how uncomfortable the working conditions may be, regardless of what other side effects such dusty atmospheres may have, certainly they do not appear to have any bearing on the development or reactivation of a tuberculous infection. It is a common experience to hear the question raised as to the effect of dust in cement plants, flour mills, saw-mills, and many other industries of a similar nature. It is well to know that there is no good evidence to indicate that permanent effects result from such occupational dusts. The degree of fibrosis in the lungs is minimal, and the incidence of tuberculosis is no greater among such workers than in the rest of the population.

Tuberculosis Increased

In the case of occupations producing dust containing large quantities of free silica, the picture is radically different. Beginning with the very earliest investigations amongst metal miners up to the most modern experimental studies, the finding that the lung fibrosis resulting from certain types and quantities of siliceous dust, now usually called silicosis, increases the tendency to develop tuberculosis, has been well borne out.

It is true that statements to the contrary have been made in this state as well as in others, but they have usually been based upon a small personal experience and incomplete observation. Too often, unfortunately, the opinions rendered have been overly influenced by the medicological considerations which so commonly becloud this whole subject. There seems no doubt that silicosis increases the incidence of tuberculosis in its victims. This is true whether the worker acquires the silicosis in the granite quarries of Barré, Vermont, where the incidence of tuberculosis is 130 times that of the remaining population, in marble quarries, in metal mines, or in the many other occupations in which the worker is exposed to dust containing free silica.

Variables Should Be Studied

In the consideration of an increased incidence of tuberculosis due to inhaled siliceous dust, numerous factors must be studied. The concentration of the silica, the character of the dust, the size of the particles, the length of exposure, and the presence of carriers of tuberculosis in the group, all are important factors in determining whether or not silicosis will occur and in turn whether the silicosis will increase the incidence of tuberculosis. Furthermore, there are many other variables, not all well understood, which make it difficult to draw conclusions for all localities based upon studies in any one area.

Fortunately in Minnesota the silicosis hazard is not an extensive one, nor does it seem to have had any marked effect upon the incidence of tuberculosis. We know that silicosis occurs to a more or less degree amongst two particularly large groups of workers in this state. Amongst the workers in the quarry industry and amongst the laborers in the iron mines some degree of

(Continued on Page 748)

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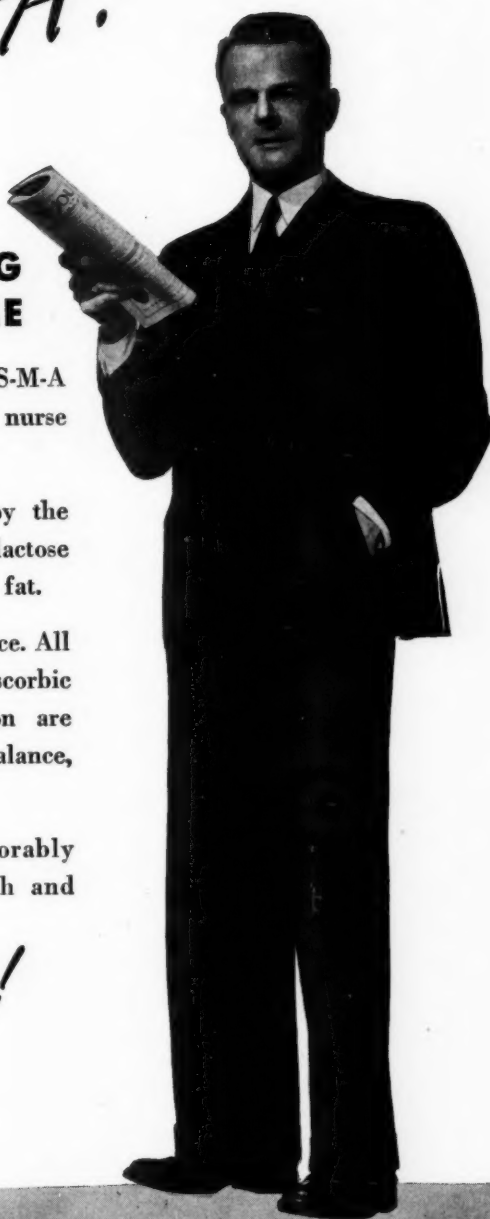
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(Continued from Page 746)

silicosis is likely to be present, at least in a small percentage of the group. Whether this has produced any increased incidence of tuberculosis in these areas has never been accurately ascertained by careful observation.

Incidence in Minnesota

Unfortunately too many of the opinions in this matter have been formed under the stress of legal procedures rather than as a result of any extensive study. It seems perfectly clear that the incidence of silicosis amongst the workers in metal mines in Minnesota, for example, is relatively small, but just what the incidence is, there is little evidence to show. It seems clear also that there are striking differences in the reactions of different groups in various localities to silica inhalation. Because of this, it is impossible to draw any conclusions about any particular industry without a fairly serious investigation of the local conditions within that industry.

One of the tasks which the committee on industrial health and occupational diseases and the State Board of Health has before it is the determination of the real facts in this situation. Clarification of our knowledge as to local conditions would be extremely useful in eliminating many controversial statements which might be undertaken to limit in so far as possible this type of occupational hazard. Such a program of investigation may prove to be a long and arduous one but will repay all the work put into it. In the struggle against tuberculosis, we must concentrate on any source of the disease. In the cases of tuberculosis induced by silicosis, the possibilities of its prevention are fruitful and certainly should be undertaken when the opportunity presents itself.

LEO G. RIGLER, M.D.

CLINICAL-PATHOLOGICAL CONFERENCE

(Continued from Page 731)

which are varied in their location and type of lesion, are seen to be caused by lesions which are primarily intravascular with congestion of sickled red cells and resulting thrombosis. Therefore, any process slowing circulation may convert sickle cell anemia to sickle cell anemia. For treatment, he believes it is necessary to combat circulatory stasis. Many unexplained surgical deaths in negroes can be explained on this basis. The anesthesia results in a slowing down of blood flow and anoxemia. The sickle cells become conglutinated and areas of thrombosis with fibrosis and necrosis occur. Most of the deaths, however, are due to secondary infection. The treatment of sickle cell anemia as far as our present knowledge of the condition is concerned, is symptomatic. Splenectomy has been tried without success. It has been said, "Why do splenectomy when the patients eventually splenectomize themselves."

MINNESOTA MEDICINE

CORRESPONDENCE

To the Editor:

Our attention has been called to your editorial on "Dilaudid Addiction" in the July issue of MINNESOTA MEDICINE. Of course, we are vitally concerned, as Dilaudid is a product of our manufacture, and therefore would like the privilege of commenting on this editorial.

We certainly agree with you that Dilaudid should be prescribed with care because of its addictive properties and have always recommended this in our advertising literature. Perhaps you would be interested in the folder which is now in current use, a copy of which is enclosed. In it the statement reads:

"Dilaudid, which is a morphine derivative, should be used with the same precautions as other opiates to avoid respiratory depression and the possibility of addiction."

So far as we know, there is nothing in the literature to indicate that Dilaudid is more addictive than morphine. In fact, there are workers who have stated that they believe Dilaudid leads more slowly to addiction than morphine, and that addicts can be taken off the drug more easily than from morphine, but we do not make any claims to this effect. Perhaps the earliest

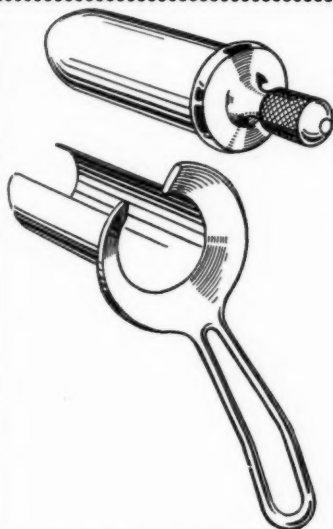
mention of the addictive properties of Dilaudid in the American literature was that by Paul Wolff in the address which he gave at the 1932 session of the American Medical Association in New Orleans (Jour. A.M.A., 98:2175, (June 18) 1932). Wolff was Secretary of the Committee of Experts on Narcotics of the League of Nations and based his remark that

"It has been shown that it (Dilaudid) leads more slowly to habituation and addiction, and its devotees are therefore more easily cured."

on the basis of over nine years experience with Dilaudid by European observers.

There are several interesting studies on the development of tolerance in experimental animals, in which Dilaudid has been compared with other opiates. Among these are Stanton (J. Pharm. & Exper. Therap., 56:253, (Feb.) 1936), Eddy and Reid (J. Pharm. & Exper. Therap., 52:468, (Dec.) 1934), and SeEVERS (J. Pharm. & Exper. Therap., 56:157, (Feb.) 1936). In all of these studies, there is no evidence that Dilaudid is any more habit forming than morphine, and SeEVERS went so far as to say that, in his studies on monkeys, he found that signs of abstinence were much more severe with heroin and morphine than with Dilaudid, when doses comparable to those used in clinical medicine were administered.

Naturally, the United States Public Health Service is interested in the addictive properties of all opiates and have carried out several studies in which Dilaudid was included. There is nothing in any of their publications



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CORRESPONDENCE

which would lead us to believe that Dilaudid is any more addictive than morphine.

We should again like to emphasize our stand that we have recognized the fact that Dilaudid is addictive in our advertising and recommend that it be considered in the same light as morphine, so far as this phase of its action is concerned.

Yours very truly,

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Fred B. Western, M.D.

To the Editor:

At the recent meeting of the Minnesota State Medical Association at Duluth, I noticed a booth assigned to the St. Louis County League for Planned Parenthood, and also two commercial "technical" exhibits of contraceptives including one movie. I feel sure that the State Medical Association has never endorsed the birth control movement.

Now that the proponents of the movement have had an opportunity to present and press their cause before the Association, it is only a matter of fairness that the opponents, of whom I am one of many in the Association, should have an opportunity to present at least some argument. I do not rate my own ability highly, but, while at the Duluth convention, I ran across an article in the June 27 number of *America*, entitled "Race Suicide Means Sheer Loss of Nerve"; its approach to the matter is so refreshing that I wish to present at least the gist of it to the Association:

"Thermopylae was much in the news a year ago. The Greeks were making another glorious, if this time futile, stand, and echoes of Thucydides came back to some of us erstwhile classicists as we followed the dispatches. Yes, there was a 'glory that was Greece,' and it seemed in those dark days to glow with an especial meaning for us.

"But there was once a disgrace that was Greece, too, in the days that followed the heroism of Thermopylae, and that

disgrace has a terrifying meaning for us today, if we can read the pages of history clearminded enough to see it.

"It was a little book by T. R. Glover, *The Influence of Christ in the Ancient World*, that sent me back for another look at this dark period in the history of a declining Greece. It sent me back to the pages of a historian of the times, one Polybius, and in the thirty-sixth book of his *History*, I found the foreboding message for today. Says he:

"In our own time, the whole of Greece has been subject to a low birth rate and a general decrease of the population, owing to which cities have become deserted and the land has ceased to yield fruit, although there have neither been continuous wars nor epidemics. . . . Men had fallen into such a state of pretentiousness, avarice and indolence that they did not wish to marry, or if married, to rear the children born to them, or at most, as a rule, but one or two of them, so as to leave these in affluence and bring them up to waste their substance, and so the evil rapidly and insensibly grew."

"Race suicide, birth control, or, to use modern jargon about a very old depravity, planned parenthood, even in the testimony of this pagan writer, was rotting the vitals of Greece, and the Romans came and conquered.

"Now, one eminent authority on those times, Professor Bury, claims that 'loss of nerve' was the mark of that age, and that this race suicide was a sure sign of it. As T. R. Glover comments: 'Life grew more and more of a riddle, and solitary hearts lost faith and lost nerve, and begot no songs and few children.'

"Now, compare this brief recounting of an historic calamity with a report emanating from London on June 7. Lord Horder, the King's physician, acknowledges the existence of the white race's birth-rate problem and attributes it to 'passive resistance in the production of new citizens. . . . In short, there has been a strike.'

"But there has been no strike against human affection. It still flows in human hearts, only now it is timid and misplaced: Britain, it was brought out in the report, now has 1,500,000 more pet dogs than she had fifty years ago. . . .

"What does this say but that our age, or at least the planned parenthoods of it, are suffering from that same 'loss of nerve' that eventually ruined an ancient and marvelous culture? Far from being a progressive or triumphant movement, birth control is a cringing thing, whose motive force is fear—fear of the economic burdens that children bring, fear of the world into which they must be born, fear of the responsibility their training entails. . . .

"The acceptance of life in its fulness means responsibility, personal responsibility. But that is not a sad thing, it is not depressing, challenging though it be. Herbert Agar, writing

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on 'The Truth Is Good News' in the May *Harpers*, reminds us that 'we cannot win the war without rising above the national irresponsibility which has given Hitler his advantage over us.' And harking back over the centuries, Mr. Glover discovers that 'the thing that above all ruined ancient society was the increasing withdrawal of responsibility from the individual.'

'Certainly, one responsibility that modern America is more and more sloughing off in despair, is that preëminently personal one of rearing children generously and gratefully. It cannot continue, if this nation is to continue to be great, not merely in matter of numbers, but above all in the fiber of its national character. For, as the student of the past whom we have been quoting reminds us: 'Men are made great by great responsibilities.' . . .

'Furthermore, with this decline of backbone to live up to duties (merely of good citizenship, let alone of morality) goes the striking parallel between the slump in family life (birth control, divorce) and the lessening of intelligent interest in our political life? To vote intelligently is a duty, and most duties bring a burden, but if we as a nation have given up hope in such an intimate thing as the family, how can we keep up hope in that much more impersonal thing, the welfare of the country? . . .

'Birth control is a defeatist propaganda disseminated by those who have lost nerve. Its wide acceptance is a certain sign that a nation is rotting from within and it can be as certain for twentieth-century America as it was for pre-Christian Greece. . . . It is unalterably opposed to the daring and adventurous spirit that has made this nation, and which, under God, must keep it.'

THEODORE H. SWEETSER, M.D.

MEDICAL BROADCAST FOR SEPTEMBER

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Saturday morning over Station WCCO, Minneapolis and St. Paul, and at 11:30 o'clock over Station WLB, University of Minnesota. Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

September 5—Swimmers' Itch

September 12—Poison Ivy

September 19—Hay Fever

September 26—Orthodontia.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held in Rochester, Monday, September 28, with a full day's program.

The morning session will be devoted to papers of general interest to the practitioner. The afternoon session will be a symposium on civilian and industrial casualties, consisting of short, to-the-point papers on shock burns, intravenous therapy, chest wounds, abdominal wounds, fractures, gas gangrene of the extremities, heat stroke, and similar topics.

All interested physicians are cordially invited to attend this meeting.



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◆ OF GENERAL INTEREST ◆

Dr. and Mrs. John L. McKelvey of Minneapolis are the parents of a son, Robert, born June 22.

* * *

Dr. and Mrs. Alphonse E. Walch of Minneapolis are the parents of a daughter, Carolyn Mary, born June 24.

* * *

Dr. C. L. Sherman of Luverne has accepted an appointment as chairman of the medical division of the Rock County Civilian Defense Council.

* * *

Leonard Telford Carlson, Jr., is the name of the young son of Dr. and Mrs. Leonard T. Carlson of Minneapolis, born August 22, 1942.

* * *

Dr. J. Arnold Malmstrom and Dr. O. E. Sarff of Virginia have dissolved partnership in the Malmstrom-Sarff Clinic. Both will continue to practice in Virginia.

* * *

Dr. Samuel Wells, fellow in the University Hospitals, Minneapolis, and Miss Helena Bengtson of Minneapolis were married July 18.

* * *

Dr. Ralph V. Platou, who has been associated in practice with his brother, Dr. Erling S. Platou, has gone to New Orleans to become acting head of the department of pediatrics at Tulane University.

* * *

Dr. Donald Cowan and Dr. Philip D. Kernan of the Students' Health Service, University of Minnesota, spent the first two weeks in August at the Minnesota State Guard training camp at Camp Ripley.

* * *

Dr. William C. MacCarty of Rochester addressed the meeting of the International College of Surgeons in Denver, July 17, on the subject "Diagnostic and Prognostic Surgical Pathology."

* * *

Drs. Berenice and Cecile Moriarty will give a reception and silver tea at their new home, 63 Otis Avenue in Saint Paul, September 20, as a benefit for the Cancer Hospital, which is under the direction of Our Lady of Good Counsel. Hours are from 5 to 8 p.m.

* * *

Dr. Jay Arthur Myers of Minneapolis was chosen president-elect of the American College of Chest Physicians during its recent annual meeting in Atlantic City, and Dr. G. A. Hedberg, Nopeming, was elected a Governor of the College.

* * *

Dr. Robert L. Meller has taken over the offices and practice of Dr. Alexander Blumstein, Minneapolis neuropsychiatrist who is now in active service. Dr. Blumstein, who has been commissioned a Major, is stationed with the Army Medical Air Corps at Mather Field, Sacramento, California.

Dr. Meller, a graduate of the University of Minnesota Medical School, has his offices at 1541 Medical Arts Building.

* * *

Dr. Arthur E. Karlstrom resigned his position as director of hygiene and health education with the Minneapolis public schools, effective August 17, in order to devote his full time to private practice. Dr. Karlstrom, a pediatrician, has offices at 1600 West Lake Street.

* * *

Two Wells physicians have entered the service of the Navy Medical Corps. Dr. P. W. Demo, who has been commissioned a Lieutenant Commander, reported for duty in Washington, D. C., August 10. Dr. M. P. Virnig, commissioned a Lieutenant, second grade, expects to be in active service before the middle of September.

* * *

Dr. Christopher R. Dix, formerly of Rochester, has opened his offices in Milwaukee, Wisconsin. A graduate of the University of Wisconsin Medical School and the University of Minnesota Postgraduate School, Dr. Dix received the second M.S. degree in Plastic Surgery to be granted in this country. He has been associated with the Mayo Foundation and Clinic since 1937.

* * *

A Red Cross Nutrition Council has been formed in Minneapolis to unify all efforts along food lines. The first general meeting of the council was held at the Curtis Hotel, August 10. Dr. W. A. O'Brien of the University of Minnesota Medical School, discussed the purpose of the council. Among organizations represented was the Hennepin County Medical Society. The council will meet the second Monday of each month.

* * *

Dr. Charles J. Hutchinson, lieutenant commander, U.S.N., is the medical officer in the United States Navy Electricians School at the University of Minnesota. He formerly was assigned to the Minneapolis navy recruiting office, but was detached from duty there four weeks ago to take charge of medical care of students in the Electricians School, one of a number of such schools located at the University. It is expected that 500 men will be taking training there.

* * *

Drs. C. W. Mayo and C. K. Maytum of Rochester, Lieutenant Colonels on the staff of the 71st General Hospital, were in Washington, D. C., last month on a twenty-eight-day tour of duty at the Army Medical Center.

Dr. Mayo is in charge of the surgical section and Dr. Maytum of the medical section of the 71st General

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* * *

Dr. C. L. Farabaugh, for the past three years a fellow and resident in Ophthalmology and Otolaryngology at the University and the Minneapolis General Hospital, has opened offices at 820 LaSalle Building, Minneapolis, for the practice of this specialty.

Previous to entering the fellowship, Dr. Farabaugh practiced medicine in Owatonna, Minnesota, for a number of years. He served in the U. S. Army as a member of the A.E.F. in France during 1918 and 1919.

* * *

Dr. O. E. Sarff of Virginia, formerly associated with Dr. J. Arnold Malmstrom in the operation of the Malmstrom-Sarff Clinic at Virginia, is reestablishing his practice in that city and has opened offices for private practice. Dissolution of the clinic was announced several weeks ago when Dr. Sarff received notice that he was to receive a commission in the medical service of the United States Army Air Force. Since then Dr. Sarff has been classified as essential to civilian life in Virginia with priority in the reassembling of necessary medical equipment.

* * *

A new appointment to the full-time staff of the Students' Health Service, University of Minnesota, announced by Dr. Ruth Boynton, director, is that of Dr. Ramona Todd, who recently completed her internship at the University of Minnesota Hospital. Dr. Todd was formerly on the staff of the University of Iowa department of bacteriology. She received her Ph.D. from that university.

Appointment of Dr. Myron Weaver, director of the Health Service at Knox College at Galesburg, Illinois, and former director of the Health Service at Carleton College, Northfield, as a staff member was announced earlier this summer.

* * *

Dr. Irvine McQuarrie, head of the pediatrics department at the University of Minnesota Medical School, is giving a series of lectures in California and Arizona this month. He was in Oakland, September 3 and 4, to address a group of Oakland pediatricians.

On September 10 and 11, he will present papers before the meeting of the Southwestern Pediatrics Society at Los Angeles. At the evening session of this society, September 10, he will speak on his "Pediatrics Experiences in China."

On September 14, Dr. McQuarrie will be in Phoenix to address a meeting of the Arizona Pediatrics Society.

To assist in opening the first Kenny unit in the country, Dr. John Pohl of Minneapolis, Sister Elizabeth Kenny, and Dr. William A. O'Brien, director of post-graduate medical education at the University of Minnesota, were in Des Moines recently. The Unit was opened by the Iowa Lutheran Hospital in that city.

Highlight of the opening was a testimonial dinner for Sister Kenny held at the Fort Des Moines hotel, July 29. More than 500 persons, including physicians, nurses and lay persons interested in crippled children

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- FRACTURES AND TRAUMATIC SURGERY**—Two Weeks Intensive Course will be offered starting September 21st. Informal Course available every week.
- GYNECOLOGY**—Two Weeks Intensive Course will be offered starting October 5th. Clinical and Diagnostic Courses every week.
- OBSTETRICS**—Two Weeks Intensive Course will be offered starting September 21st. Informal Course every week.
- OTOLARYNGOLOGY**—Two Weeks Intensive Course will be offered starting September 14th. Clinical and Special Courses every week.
- OPHTHALMOLOGY**—Two Weeks Intensive Course will be offered starting September 28th. Five Weeks Course in Refraction Methods starting October 19th. Informal courses every week.
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treatment, attended. Drs. Pohl and O'Brien and Sister Kenny spoke. Motion pictures were shown.

A clinic for visiting doctors was conducted on the morning of July 30.

A Kenny Unit consists of a special section in a hospital where the Kenny treatment of poliomyelitis is carried on by doctors, nurses and technicians trained at the University of Minnesota in Minneapolis.

* * *

Additional promotions in the University of Minnesota Medical School, announced by Dr. H. S. Diehl, dean, follow:

Dr. Lawrence R. Boies, promoted from clinical associate professor and director of the division of otolaryngology, to clinical professor and director of the division.

Dr. Walter P. Gardner, from clinical instructor to clinical assistant professor of medicine.

Dr. Herman Kabat, from instructor in physiology to assistant professor.

Dr. John J. Boehrler, from instructor of preventive medicine and public health to assistant professor.

Dr. Louis Sperling, from clinical instructor of surgery to clinical assistant professor of surgery.

Dr. John H. Moe, from clinical instructor in orthopedic surgery to clinical assistant professor.

Dr. John F. Pohl, from clinical instructor in orthopedic surgery to clinical assistant professor.

* * *

Several Minnesota men will be among the speakers at the one hundred and first annual meeting of the State Medical Society of Wisconsin to be held in Milwaukee, September 14-16. Among them are:

Dr. Wallace H. Cole, Saint Paul, "The Kenny Treatment of Anterior Poliomyelitis."

Dr. Arlie R. Barnes of Rochester, "Diagnosis of Pathologic Conditions of the Heart."

Dr. Stuart W. Harrington, Rochester, "Constricting Pericarditis."

Dr. Wesley W. Spink, Minneapolis, "The Clinical Applications and Complications of the Sulfonamides."

Dr. Edgar A. Hines, Jr., Rochester, "Normal Range and Hereditary Factors in Hypertension."

Dr. Elexious T. Bell of Minneapolis, "Pathology of Hypertension." Dr. Bell will also preside over a round-table discussion on the "Etiology of Hypertension."

Dr. Edward H. Rynearson, Rochester, "Actual Clinical Disturbances of the Endocrine Glands."

Dr. Herman O. McPheeters, Minneapolis, "The Present-Day Treatment of Varicose Veins."

Dr. Thomas L. Pool, Rochester, "The Treatment of Urinary Tract Infections with the Sulfonamide Group of Drugs."

Minneapolis physicians now in the service include the following:

Major Daniel H. Bessessen has been commissioned and is now on duty at Fort Douglas, Utah.

Major Donald W. Pollard has been ordered to duty at Lawson General Hospital, Fort Benning, Georgia. Major Pollard has been granted leave of absence for the duration from his duties as Superintendent of the Minneapolis General Hospital.

Captain Frank C. Andrus has orders to report to

the Army Medical Center, Washington. During his absence, his work as Pathologist at MGH will be handled by A. J. Hertzog, St. Barnabas Hospital, and Stanley Lofsness, Teaching Fellow at the University.

Captain U. Schuyler Anderson is under orders to report to the Boca Raton Aviation Base, Florida, early next month.

Captain Louis Sperling has reported for duty at Fort Snelling.

Captain Arshavir Ignatius has been commissioned and sent to Atlanta, Georgia, for duty. Captain Ignatius, formerly District Surgeon, CCC, is a Visiting Member.

First Lieutenant Melvin B. Sinykin has been ordered to duty at Fort Douglas, Utah.

Major Allan G. Rewbridge has been assigned to duty with an air corps unit at Fort Douglas, Utah.

Captain Sigsbee R. Seljeskog and First Lieutenant Donald B. Simonson have been assigned to duty at Fitzsimons General Hospital, Denver.

First Lieutenant Harvey J. Brekke's orders took him to Camp Carson, Colorado.

Dr. C. J. Holmberg is head of the ear, nose and throat division of the new medical corps unit recently organized at Camp Custer, Michigan. He holds the rank of Major.

* * *

Among physicians in the state who have been called to service with the United States Army the past month are the following:

Dr. E. V. Allen of Rochester, upon completion of a six weeks' assignment in the office of the Surgeon General and in the Walter Reed Hospital, Washington, D. C., will become medical consultant and coordinator of professional services of the Seventh Service command with headquarters in Omaha. He is a Lieutenant Colonel in the Army Medical Corps.

Dr. Frederick P. Army of Preston has been commissioned a First Lieutenant and reported for duty August 21.

Dr. Norman Carlson of Melrose, First Lieutenant, is located at Carlisle Barracks, Pennsylvania.

Dr. George M. Ruggles of Forest Lake, Captain, reported for duty August 24.

Dr. Harold Stoen of Milan is in service at Colorado Springs, Colorado.

Dr. Phillip S. Hench left Rochester August 6 to report for active duty with the medical corps, having been commissioned a Lieutenant Colonel. After preliminary assignment at Fort Custer, Michigan, he expects to be transferred to the station hospital at Camp Carson, Colorado Springs, Colorado.

Dr. E. C. Paulson, who has been associated with Drs. Parson and Parson at Elbow Lake the past year, has entered the Army Medical Service and is stationed at the Air Base Hospital, Portland, Oregon.

Dr. James A. Blake of Hopkins has enlisted in the Army with the commission of First Lieutenant. His father, Dr. James Blake, will continue the practice at the Blake Clinic, in which the two have been associated.

Dr. Wallace Beckman of Richfield is now stationed at a camp in Washington state.

Dr. J. E. Haes of Vernon Center has been accepted

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in the Army aviation corps. He will enter active duty on September 13.

Dr. J. C. Vezina of Mapleton has received his appointment as captain of the medical corps in the Minnesota State Guards and has been assigned to the medical detachment of the Third Regiment located at Mankato.

HOSPITAL NEWS

The city of Redwood Falls last month purchased the Redwood Falls hospital from Dr. T. E. Flinn and Dr. J. Gordon Cole.

* * *

According to an announcement made by Lt. Comm. Douglas Campbell, a 250-bed hospital is soon to be erected at Wold-Chamberlain naval air base. The site of the new hospital consists of the area included in three double-length city blocks along Fifty-ninth Street and the present north boundary of the field.

* * *

The Windom Hospital Association, through a memorial donation of \$500 received from the estate of Peter J. Velve of Jackson County, will furnish a double room in the hospital.

* * *

The annual meeting of the staff of the St. Cloud Hospital was held in that city, July 14. Speakers included Raymond Amberg, superintendent of the University of Minnesota Hospitals, and Dr. William A. O'Brien, director of postgraduate medical education at the University of Minnesota.

* * *

At the annual meeting of the Ortonville Evangelical Hospital the following were elected to the Board of Directors: Rev. L. C. Milliken, Big Stone City; John H. Iszler, Twin Brooks; Otto Krueger, Milbank. Officers elected are: President, Rev. Charles W. Zech, Watertown; vice president, Rev. L. C. Milliken, Big Stone City; secretary-treasurer, Paul Trapp, Jr., Big Stone City; Superintendent, Helen Flemming.

* * *

The first hospital in this country to be devoted entirely to Sister Kenny's infantile paralysis treatment will be opened in Minneapolis this month. It is the Sheltering Arms hospital on West River Road near Forty-second Street, which will be operated by St. Barnabas hospital, oldest in Minneapolis. In recent months, St. Barnabas hospital has been treating an increasing number of polio patients with a staff trained by Sister Kenny.

Priorities on essential materials to remodel the hospital have been granted, and work is going forward to revamp the building into a 40-bed hospital for polio patients. Remodeling costs will run about \$30,000. If necessary, the hospital can later be developed to 100 beds. Sumner T. McKnight is chairman of the building committee.

Heading the staff of the Kenny institution will be Miss Nellie Gorgas, formerly of the University of Chicago clinic hospitals; Dr. Wallace A. Cole, professor and director of the division of orthopedic surgery at the University of Minnesota, and Dr. Miland E. Knapp, director of the division of physical therapy at the University of Minnesota.

MINNESOTA MEDICINE

BOOK REVIEWS

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

WAR MEDICINE. A symposium. Winfield Scott Pugh, M.D., Editor; Commander (M.C.), U.S.N. Retired; formerly Surgeon, City Hospital, New York City; Associate Editor, Edward Podolsky, M.D.; Technical Editor, Dagobert D. Runes, Ph.D. 565 pages. Illus. Price, \$7.50, cloth. New York: Philosophical Library, Inc., 15 E. 40th St., 1942.

PSYCHOTHERAPY IN MEDICAL PRACTICE. Maurice Levine, M.D. Attending Psychiatrist, Cincinnati General Hospital; Assistant Professor of Psychiatry, University of Cincinnati College of Medicine; Training Psychoanalyst, Chicago Institute for Psychoanalysis; Diplomate of American Board of Psychiatry and Neurology. 320 pages. Price, \$3.50, cloth. New York: The Macmillan Co., 1942.

SYNOPSIS OF PATHOLOGY. W. A. D. Anderson, M.A., M.D. Assistant Professor of Pathology, St. Louis University School of Medicine; Pathologist to St. Mary's Group of Hospitals. 661 pages. Illus. Price, \$6.00, flexible binding. St. Louis: C. V. Mosby Co., 1942.

EMERGENCY CARE. Marie A. Wooders, B.S., R.N., Principal, School of Nursing, Hackensack Hospital, Hackensack, N. J.; and Donald A. Curtis, M.D., Lt.

Col. Medical Reserve, Commanding 342nd Medical Regiment, United States Army; Instructor in Military Nursing, Hackensack Hospital. 560 pages. Illus. Price, \$3.50, cloth. Philadelphia: F. A. Davis Co., 1942.

CLINICS. Vol. 1, No. 1. (Semi-monthly. Successor to New International Clinics). George Morris Piersol, M.D., Editor. 264 pages. Illus. Price, \$12.00 per year, \$2.00 per issue; cloth bound, \$16.00 per year, \$3.00 per issue (by subscription), 50c additional for foreign and Canadian postage. Philadelphia: J. B. Lippincott Co., 1942.

FRACTURES, DISLOCATIONS AND SPRAINS. John Albert Key and H. Earle Conwell. 3rd Ed. 1303 pages. Illus. Price, \$12.50, cloth. St. Louis: C. V. Mosby Co., 1942.

Since the publication of the first edition of this book in 1934, it has become one of the standard guides for the treatment of traumatic injuries. The new third edition follows the comprehensive scope of the original work. The opening paragraph of the first chapter strikes one as being particularly pertinent and should be read by every doctor who is responsible directly or indirectly for the treatment of fractures in various hospitals. "One of the principal reasons for the poor results so frequently seen in the treatment of fractures and one of the reasons why so many men who see an occasional fracture dislike to treat it is that adequate fracture treatment cannot be carried out efficiently and successfully without apparatus, and at the present time



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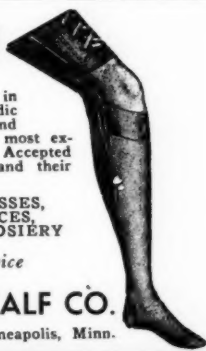
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in the majority of general hospitals in this country there is a real lack of the necessary apparatus for the proper handling of fracture cases."

Some of the newer methods of treatment are brought out. In compound fractures the use of internal fixation is discussed. The local use of the sulfa drugs in fresh compound fractures and in the old infected fractures is mentioned. The use of these newer drugs to prevent wound infection in clean surgical wounds in bone and joint cases is stressed. The authors advocate the hanging cast method in the treatment of a large percentage of humeral shaft fractures. The various methods of hip nailing for fracture of the femoral neck are thoroughly discussed. The immediate immobilization of these fractures is advised, but the authors' method of using a hip spica seems unnecessarily cumbersome. It is pointed out that the inadequate methods used in treating finger fractures result in considerable disability in many cases of this common injury. The various aspects of back strain and industrial backs are gone into, emphasis being placed on the intensive treatment of acute injuries, with the object of preventing the chronic cases which are so resistant to treatment.

In many instances several methods of treatment are mentioned for one particular injury without the benefit of the authors' experience as a guide. Aside from this, the book is a comprehensive and safe reference for the general practitioner who necessarily treats the major share of these conditions. In time of war with a possible augmentation of injuries to the civilian population,

a work of this nature should be on every practitioner's shelf.

S. S. HOUKOM, M.D.

THE CARE OF THE AGED (Geriatrics). Malford W. Thewlis. Fourth Edition. 589 pages. Illus. Price \$7.00. St. Louis: C. V. Mosby Co., 1942.

The fact that this excellent book has passed from the third edition to the fourth edition in one year bespeaks the increasing interest in Geriatrics and the belief that this author has admirably catalogued the practical therapeutic connotations.

The new edition fortunately does not add materially to the size of the book, but certain items such as Chemotherapy in Surgery have been added apropos of the recent war experiences. The book contains a wealth of general information. It becomes a compact review of present-day therapy for disease. The chapters are well supported by references. The author and his associates have evidently surveyed all the available current literature dealing with the problems arising from age extension. The book does not aim (as does Cowdry's Compilations, for example) to cover extensively the biological, chemical, and psychological aspects of aging.

You will nevertheless make no mistake in adding the book to your library.

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